The New England JOURNAL of MEDICINE

FORMERLY THE BOSTON MEDICAL AND SURGICAL JOURNAL

Official Organ of The Massachusetts Medical Society
The New Hampshire Medical Society — The Vermont State Medical Society
The New England Surgical Society — The Boston Surgical Society, Inc.
The New England Pediatric Society — The New Hampshire Surgical Club
The New England Obstetrical and Gynecological Society
And The Neisserian Medical Society of Massachusetts

OWNED AND PUBLISHED BY THE MASSACHUSETTS MEDICAL SOCIETY

Volume 211 Number 7 | Domestic $6 per Annum, 25c per Copy Canada $7.04, Foreign $8.52 | AUGUST 16, 1934 | Published Weekly in Boston at 8 The Fenway

CONTENTS

THE MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS AND GYNECOLOGY

Prolan in the Treatment of Abnormal Uterine Bleeding. *Joe Vincent Meigs* 289
Fetal Birth Injuries with Special Reference to Intracranial Lesions. *P. Brooke Bland* 296
Radium Therapy in Uterine Hemorrhages of Benign Origin. *Louis E. Phaneuf* 304

MASSACHUSETTS TUBERCULOSIS LEAGUE

The Prevention and Control of Tuberculosis in the Commonwealth of Massachusetts with Special Reference to the Activities of the Massachusetts Tuberculosis League. *Frederick T. Lord* 312
Annual Report of Executive Secretary of the Massachusetts Tuberculosis League. *Frank Kiernan* 314
Annual Report of the Educational Secretary of the Massachusetts Tuberculosis League. *Jean V. Latimer* 318

Arthritis as a Possible Manifestation of Allergy to Insulin. *Allen S. Johnson* 321

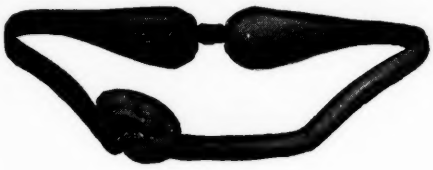
CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

Case 20331—*Richard H. Sweet, Walter S. Burrage, Tracy B. Mallory, Chester M. Jones* and others. Case 20332—*Harold L. Higgins* and *Tracy B. Mallory* 323

EDITORIALS

Domiciliary Medical Care for the Indigent 328
Vitamin A and Colds 328
Another Diagnostic Method for Cancer? 329
This Week's Issue 329

(Contents continued on next page)



SURGICAL APPLIANCES
for
OVER SIXTY-FIVE YEARS

Frame Trusses
Belts *Corsets*
Elastic Stockings
Artificial Limbs
Orthopedic Appliances

The POMEROY Frame Truss

Closely contacting the body at every point, the Pomeroy Frame Truss is unaffected by movement or changes in position. Combined with the water pad (first used by Pomeroy over sixty-five years ago), it is the one apparatus perfectly adapted to retain the hernia.

The fitting and shaping is done by experts since the usefulness of the Frame Truss depends on accurate adjustment. Guaranteed to retain hernia comfortably and securely *when fitted by Pomeroy.*

Pomeroy Company

41 West Street, Boston, Mass.

New York Brooklyn Springfield
Bronx Newark Detroit
Wilkes Barre

Entered at the Postoffice at Boston as Second Class Matter

CONTENTS

(Continued)

BOOK REVIEWS

Corrective Physical Education. Josephine Langworthy Rathbone 337
Fundamentals of Biochemistry in Relation to Human Physiology. T. R. Parsons 338
The Laboratory Notebook Method in Teaching Physical Diagnosis and Clinical History Recording. Logan Clendening 338
A Practical Treatise on Diseases of the Skin for the Use of Students and Practitioners. Oliver S. Ormsby and Clark Wylie Finnerud 338
La Résection Endoscopique de la Prostate. Ed. Papin 337

BOOKS RECEIVED FOR REVIEW 337

CORRESPONDENCE

Added Thoughts on the Art of Criticism. John J. Hurley 333
Adherence to Ethics of Practice. Nicholas A. Mastroianni 333
The Coöperation of Surgeons Recognized. Shields Warren 334

MISCELLANY

Do Present Vital Statistics Mean Anything? 322
Massachusetts Department of Public Health. Division of Adult Hygiene. Cancer Clinic Bulletin 331
More Automobile Deaths This Year 322
Mortality Rates 331
Multiple Births 332
Ode to the Doctor and His Wife 336
Uniform Preliminary Education for the Practice of the Healing Arts 333
Veterinary Help in Man's Problems. John R. Mohler 330

NOTICES 335
OBITUARY 334
RECENT DEATH 334
REPORT OF MEETING 335
SOCIETY MEETINGS, CONGRESSES AND CONFERENCES 336

The Massachusetts Medical Society

The next Annual Meeting of the Massachusetts Medical Society will be held in Boston, at the Hotel Statler, June 3, 4, and 5, 1935.

OFFICERS AND STANDING COMMITTEES ELECTED BY THE COUNCIL, JUNE 5, 1934

PRESIDENT: WILLIAM H. ROBEY, Boston.
VICE-PRESIDENT: PHILEMON E. TRUESDALE, Fall River.
SECRETARY: WALTER L. BURRAGE, Brookline.
TREASURER: CHARLES S. BUTLER, Boston.

STANDING COMMITTEES FOR 1934-1935

COMMITTEE OF ARRANGEMENTS
W. M. Shedden, *Chairman;* W. R. Morrison, Horatio Rogers, W. S. Burrage, R. P. Stetson.

COMMITTEE ON PUBLICATIONS
R. I. Lee, *Chairman;* Homer Gage, R. B. Osgood, R. M. Smith, F. H. Lahey.

COMMITTEE ON MEMBERSHIP AND FINANCE
D. N. Blakely, *Chairman;* Gilman Osgood, G. C. Caner, J. E. Fish, H. F. Newton.

COMMITTEE ON ETHICS AND DISCIPLINE
David Cheever, *Chairman;* W. D. Ruston, S. F. McKeen, A. C. Smith, R. L. DeNormandie.

COMMITTEE ON PERMANENT HOME: T. J. O'Brien, *Chairman;* S. B. Woodward, C. G. Mixter, J. M. Birnie, R. B. Greenough.

COMMITTEE ON MEDICAL EDUCATION AND MEDICAL DIPLOMAS
Reginald Fitz, *Chairman;* C. H. Lawrence, C. A. Sparrow, E. S. Calderwood, A. S. Begg.

COMMITTEE ON STATE AND NATIONAL LEGISLATION
W. H. Robey, *Chairman;* T. J. O'Brien, F. E. Jones, A. W. Marsh, Shields Warren.

COMMITTEE ON PUBLIC HEALTH
Dwight O'Hara, *Chairman;* E. F. Cody, F. G. Curtis, Gerald Hoeffel, G. D. Henderson.

COMMITTEE ON MALPRACTICE DEFENSE
F. G. Balch, *Chairman;* E. D. Gardner, F. B. Sweet, R. P. Watkins, A. W. Allen.

OFFICERS OF THE SECTIONS FOR 1935

ELECTED BY THE SECTIONS

(The street addresses may be obtained from the Annual Directory)

SECTION OF MEDICINE
Chairman, Francis M. Rackemann, Boston; *Secretary,* Richard P. Stetson, Chestnut Hill and Boston.

SECTION OF SURGERY
Chairman, Ralph W. French, Fall River; *Secretary,* E. Parker Hayden, Boston.

SECTION OF TUBERCULOSIS
Chairman, Donald S. King, Boston; *Secretary,* Olin S. Pettingill, Middleton.

SECTION OF DERMATOLOGY AND SYPHILOLOGY: *Chairman,* Charles J. White, Boston; *Secretary,* William P. Boardman, Boston.

SECTION OF PEDIATRICS
Chairman, Joseph Garland, Boston; *Secretary,* James M. Baty, Belmont and Boston.

SECTION OF OBSTETRICS AND GYNECOLOGY
Chairman, Thomas Almy, Fall River; *Secretary,* Charles J. Kickham, Brookline.

SECTION OF RADIOLOGY AND PHYSIOTHERAPY
Chairman, Franklin P. Lowry, Newton; *Secretary,* Philip H. Cook, Worcester.

OFFICERS OF THE DISTRICT MEDICAL SOCIETIES

ELECTED BY THE DISTRICT MEDICAL SOCIETIES AT THEIR ANNUAL MEETINGS, BETWEEN APRIL 15 AND MAY 15, 1934.

(The street addresses may be obtained from the Annual Directory)

BARNSTABLE—*President,* J. L. Chute, Osterville; *Vice-President,* P. P. Henson, Hyannis; *Secretary,* J. I. B. Vail, Hyannis; *Treasurer,* H. B. Hart, Yarmouthport; *Librarian,* E. E. Hawes, Hyannis.

BERKSHIRE—*President,* W. P. Kelly, Pittsfield; *Vice-President,* R. J. Carpenter, North Adams; *Secretary,* H. J. Downey, Pittsfield; *Treasurer,* C. T. Leslie, Pittsfield.

BRISTOL NORTH—President, F. V. Murphy, Attleborough; *Vice-President,* L. E. Butler, Taunton; *Secretary,* C. B. Kingsbury, Taunton; *Treasurer,* J. V. Chatigny, Taunton.

BRISTOL SOUTH—*President,* Frank M. Howes, New Bedford; *Vice-President,* E. L. Merritt, Fall River; *Secretary-Treasurer,* Charles Shanks, New Bedford.

ESSEX NORTH—*President,* John Parr, Methuen; *Vice-President,* C. F. Warren, Amesbury; *Secretary-Treasurer,* E. S. Bagnall, Groveland.

ESSEX SOUTH—*President,* C. L. Hoitt, Lynn; *Vice-President,* G. E. Tucker, Salem; *Secretary,* R. E. Stone, Beverly; *Treasurer,* Andrew Nichols, III, Danvers; *Librarian,* C. M. Cobb, Lynn.

FRANKLIN—*President,* H. B. Marble, Shelburne Falls; *Vice-President,* W. J. Pelletier, Turners Falls; *Secretary-Treasurer,* Charles Moline, Sunderland.

HAMPDEN—*President,* A. J. Douglas, Westfield; *Vice-President,* T. S. Bacon, Springfield; *Secretary-Treasurer,* H. L. Smith, Springfield.

HAMPSHIRE—*President,* T. F. Corriden, Northampton; *Vice-President,* L. B. Pond, Easthampton; *Secretary-Treasurer,* F. E. O'Brien, Haydenville; *Librarian,* Jane B. Armstrong, Northampton.

MIDDLESEX EAST—*President,* J. H. Fay, Melrose; *Vice-President,* F. O West, Woburn; *Secretary,* K. L. Maclachlan, Melrose; *Treasurer,* Richard Dutton, Wakefield; *Librarian,* J. M. Wilcox, Woburn.

MIDDLESEX NORTH—*President,* F. R. Mahony, Lowell; *Vice-President,* E. O. Tabor, Lowell; *Secretary,* T. A. Stamas, Lowell; *Treasurer,* M. D. Bryant, Lowell; *Librarian,* P. J. Mechan, Lowell.

MIDDLESEX SOUTH—*President,* A. H. Blake, West Somerville; *Vice-President,* S. H. Remick, Waltham; *Secretary,* A. A. Levi, Cambridge; *Treasurer,* Edward Mellus, Newton; *Librarian,* N. A. Gallagher Malden.

NORFOLK—*President,* Cadis Phipps, Brookline; *Vice-President,* L. F. Johnson, Norwood; *Secretary,* F. S. Cruickshank, Brookline; *Treasurer,* G. W. Kaan, Sharon.

NORFOLK SOUTH—*President,* F. A. Bartlett, Quincy; *Vice-President,* T. B. Alexander, Scituate; *Secretary-Treasurer-Librarian,* N. R. Pillsbury, South Braintree.

PLYMOUTH—*President,* L. A. Alley, Lakeville; *Vice-President,* W. T. Hanson, Bridgewater; *Secretary,* G. A. Moore, Brockton; *Treasurer,* A. C. Smith, Brockton; *Librarian,* J. H. Weller, Bridgewater.

SUFFOLK—*President,* R. L. DeNormandie, Boston; *Vice-President,* Conrad Wesselhoeft, Boston; *Secretary,* G. P. Reynolds, Boston; *Treasurer,* John Rock, Boston.

WORCESTER—*President,* E. B. Emerson, Rutland; *Vice-President,* W. F. Lynch, Worcester; *Secretary,* E. C. Miller, Worcester; *Treasurer,* E. P. Disbrow, Worcester; *Librarian,* A. C. Getchell, Worcester.

WORCESTER NORTH—*President,* C. B. Gay, Fitchburg; *Vice-President,* C. H. Jennings, Fitchburg; *Secretary,* F. M. McMurray, Fitchburg; *Treasurer,* F. H. Thompson, Jr., Fitchburg.

Fellow members. We want your support.

The New England
Journal of Medicine

VOLUME 211 AUGUST 16, 1934 NUMBER 7

The Massachusetts Medical Society

SECTION OF OBSTETRICS AND GYNECOLOGY

**Chamber of Commerce Hall, Worcester, Mass.,
Wednesday, June 6, 1934, 9 A. M.**

PRESIDING:

Dr. Joseph W. O'Connor, Worcester, Chairman.
Dr. Thomas Almy, Fall River, Secretary.

CHAIRMAN O'CONNOR: The meeting will please come to order. The first paper to be presented this morning is entitled "Prolan in the Treatment of Abnormal Uterine Bleeding", by Dr. Joe Vincent Meigs, of Boston.

PROLAN IN THE TREATMENT OF ABNORMAL UTERINE BLEEDING*

BY JOE VINCENT MEIGS, M.D.†

INTRODUCTION

THE treatment of abnormal uterine bleeding by means of gland extracts is not new. All results obtained by the use of dried ovarian, corpus luteum and anterior pituitary substances are probably of very little significance for it can be shown in the laboratory that these materials are of almost no physiological potency. Even in large doses they will not cause changes in the vagina, endometrium or ovaries of experimental animals. Since the discovery of the actual hormones of the ovary and pituitary a much more scientific attempt has been made to treat this condition. Novak and Hurd[1] have reported good results in forty-four out of fifty-one cases and Smith and Rock[2] in fifty out of fifty-six cases by the use of a "luteinizing hormone" or prolan. The present paper is a report from the Ovarian Dysfunction Clinic at the Massachusetts General Hospital of fifty-nine patients treated in a similar manner. That there is considerable variation in results will be shown by an analysis of these cases.

PROLAN

Prolan (Antophysin, Antuitrin S, Follutein) is the name given by Zondek to a hormone found in the anterior pituitary and in the urine of pregnant women that will cause luteinization in the ovaries of infant mice. Exactly what this substance is, is not known and there are many theories as to its origin. Implantation of pieces of anterior pituitary gland has nearly the same effect on infant mouse ovaries as has the hormone from the urine of pregnant women. It has been contended with considerable evidence that these two hormones, the one from the urine and the one from the pituitary, are different substances. The fetal ectoderm is supposed to be the source of the urinary luteinizing hormone and the anterior pituitary of the pituitary luteinizing hormone. It is not unreasonable to assume that these two hormones affecting infant ovaries in the same manner are the same substance. The argument, however, is not as yet settled. Experiments on mice with the pituitary removed tend to show that the two are different. That the fetal ectoderm is of importance is shown in cases of hydatidiform mole and chorionepithelioma where the fetal tissues are enlarged or growing rapidly. Here the amount of luteinizing substance in the urine is markedly increased and may produce large luetin cysts in the ovaries. Novak has reported that the basophilic cells (probable secretors of the sex hormone) of the anterior pituitary gland were much increased in one case of chorionepithelioma. Therefore, whether the urinary hormone arises in the fetal ectoderm and affects the pituitary or is from the pituitary itself is a difficult question to answer.

Prolan is supposed to be divided into two parts, Prolan A and Prolan B. Prolan A is believed to stimulate follicle ripening in the ovary and Prolan B to cause luteinization in the ovary. The latter is responsible for the reaction in the ovaries, known as the Aschheim-Zondek test. There is much discussion as to whether these two divisions of prolan are qualitative or only quantitative. Perhaps if they are the same hormone, small amounts might cause follicle rip-

*Presented before the Section of Obstetrics and Gynecology of the Massachusetts Medical Society, at its Annual Meeting, Worcester, June 6, 1934.

From the Ovarian Dysfunction Clinic of the Massachusetts General Hospital.

†Meigs, Joe Vincent—Surgeon to Out-Patients, Massachusetts General Hospital. For record and address of author see "This Week's Issue," page 329.

ening and larger amounts might cause luteinization. In a recent study of eight cases treated with prolan at the Massachusetts General Hospital previous to operation, both excess follicle ripening and theca luteinization were found. It was evident that the hormone acted upon the human ovary in a manner somewhat similar to its action upon infant mice ovaries.

PATHOLOGY OF CERTAIN CASES OF ABNORMAL BLEEDING

Schröder[3] and Shaw[4] have studied cases of abnormal bleeding and have reported similar pathological findings. In one group with amenorrhea followed by bleeding (fig. I) there is sloughed endometrium can be plainly seen. It is from this area that the bleeding took place. It seems likely, therefore, that severe bleeding can occur from such sloughing areas.

In another type of abnormal bleeding the presence of too many corpora lutea may be noted. (Fig. III.) It must be assumed that this is due to too frequent ovulation and that the cycle, which is usually two weeks, is too short and does not allow proper involution of the uterus. The bleeding is considered to come from the premature breakdown of a poorly formed endometrium. In these cases the corpus luteum influence is considered to be weak, and bleeding is due to defective corpora lutea.

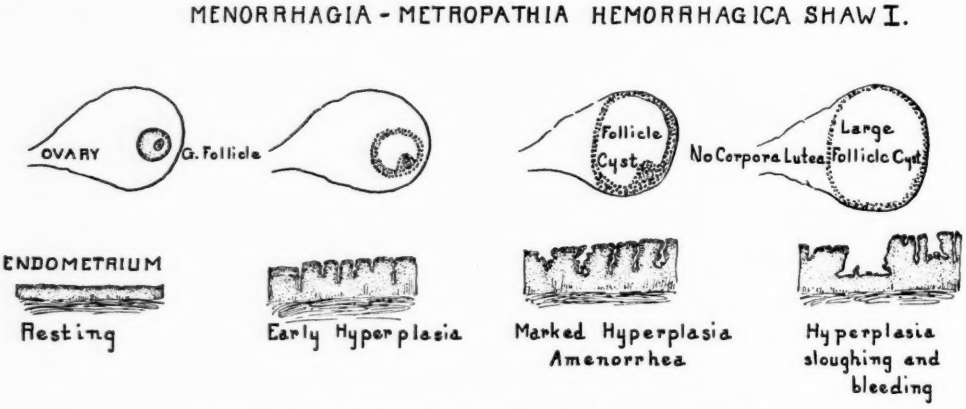


FIG. I. The follicle does not rupture, no corpus luteum is formed, and hyperplasia of the endometrium develops. Bleeding occurs from the broken-down endometrium.

present a persistent follicle cyst or large atretic follicle or unruptured follicle. The rest of the ovary is wrinkled and atrophied and there is an absence of recent corpora lutea. The endometrium shows hyperplasia of the Swiss cheese type. The ovary is apparently at a standstill and there is no rhythm. The persistence of the follicle, containing as it does estrin, is considered to be responsible for the hyperplasia. The lack of corpora lutea means a lack of progestin or corpus luteum hormone and therefore an absence of a proper premenstrual endometrium. Thus the menstrual cycle is incomplete and when bleeding takes place it is certainly not menstruation. The bleeding in these cases is considered by Shaw to be due to a breakdown and sloughing of the thickened endometrium. Novak does not feel convinced of this fact and cannot believe that from the very small sloughing areas seen in such endometria, such severe bleeding can take place. Figure II, however, shows that this area of slough can be of considerable size. This patient had a typical history of recent abnormal bleeding and was sent to the hospital for operation in the amenorrheic stage. The night before operation she began to bleed severely and the next morning the uterus was removed by total hysterectomy. The uterus was not curetted and a large area of

In another type of bleeding the corpus luteum itself is considered the offender. (Fig. IV.) It is persistent or cystic, and a thickening of the endometrium occurs that is decidual in type. When the corpus luteum finally loses control, severe bleeding occurs due to a breakdown of the thickened endometrium.

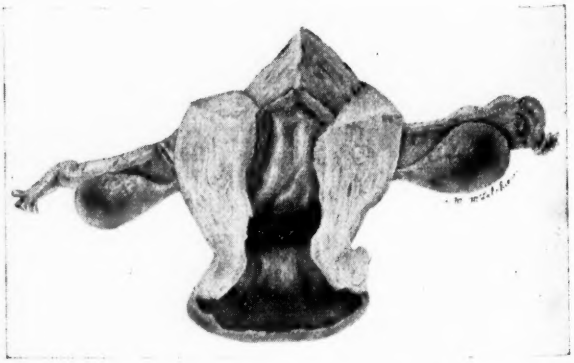


FIG. II. Metropathia hemorrhagica or Shaw Type I. Just above the internal os can be seen a large area of sloughing endometrium. The hyperplasia, follicle cysts of both ovaries and wrinkling of the ovary are evident.

WHY PROLAN IS USED

The above short description of the pathology of certain cases of uterine bleeding gives a clue to the reason for the use of prolan. In one in-

stance there are no corpora lutea and, as prolan can cause follicle ripening and luteinization in mice and theca luteinization in human beings, it is obvious that this form of treatment might will be resumed. In the third type, that of a persistent or cystic corpus luteum, prolan may cause follicle ripening and the presence of estrin and may break up the control of the excessive

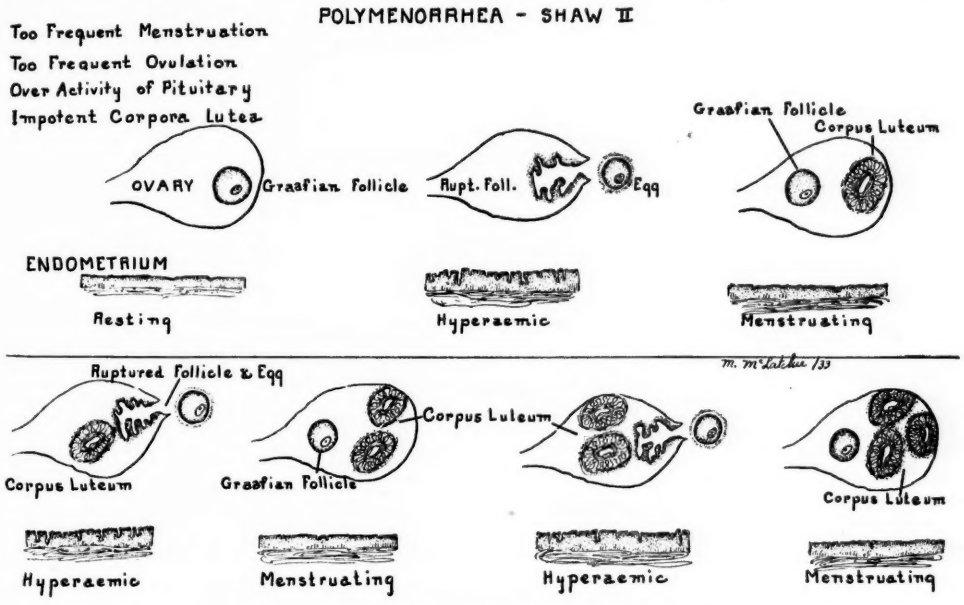


FIG. III. The menstrual cycle is too rapid and proper involution impossible. The cycle is either two or three weeks. Three corpora lutea or more may be present in one ovary.

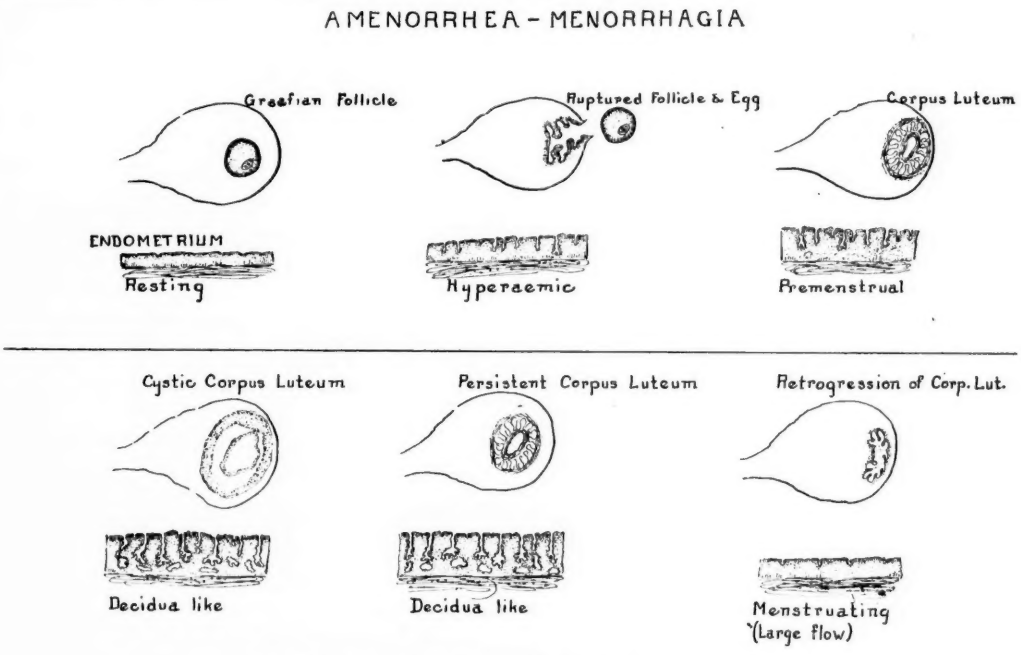


FIG. IV. A cystic or a persistent corpus luteum is responsible for a decidual-like endometrium. A large menstrual flow follows the breakdown of this endometrium. Amenorrhea precedes menorrhagia.

be successful. In the second type corpora lutea, although present, are formed too often and are not of sufficient strength to prevent too frequent follicle ripening. In this type, prolan by assisting the supposedly weak corpora lutea will prevent follicle formation and a proper cycle progestin. It is true that these assumptions are not proved, but with them as a working basis the reason for prolan therapy is clear.

Novak suggests that there is a positive bleeding factor in some of these bleeding cases and that prolan counteracts it. He believes this to

be true because prolan in many instances causes an almost immediate cessation of bleeding. Smith and Rock suggest that there is an abnormal factor in the anterior pituitary that causes the abnormal pathology and that prolan counteracts or inhibits this factor. The author feels that in certain cases the thickened polypoid type of endometrium is susceptible to circulatory changes and that sloughing and bleeding may easily occur. He also feels from a study of the ovaries of patients treated with prolan and later operated upon that theca luteinization takes place very quickly and that if improper estrin-progestin balance is responsible for the formation of hyperplasia of the endometrium and consequent bleeding, so the correcting of this improper balance should cause proper formation of the endometrium and cessation of bleeding.

There are numerous theories available but all the facts are not known. It would seem, at least theoretically, that an upset of the proper estrin-progestin relation could cause a disturbance in menstruation of an amenorrheal type or of an abnormal bleeding type.

TREATMENT

Nearly all patients coming to the Ovarian Dysfunction Clinic complaining of abnormal bleeding are treated with prolan. The patients near the menopause, however, are not treated until after a preliminary curettage, for the possibility of cancer of the cervix, endocervix or body of the uterus should be ruled out. Inasmuch as tumors of the ovary can also be responsible for abnormal bleeding, the possibility of an ovarian neoplasm must be excluded. One of the great dangers of the use of prolan therapy is that patients will be treated without proper investigation of the cervix and uterus and cases of cancer will be overlooked. Such a case occurred in the Clinic and is of such great importance that it is cited here. The patient, aged 29, had a history of abnormal bleeding of the so-called hyperestrin or hypoprogestin type. She had been curetted numerous times and polyps and hyperplasia of the endometrium found. In our clinic she was given prolan which seemed proper, but as the response was not satisfactory a curettage was done and the patient found to have cancer of the body of the uterus. Such a case should never be forgotten by those of us who are to use this type of treatment.

The patients are given from 500 to 1000 rat units of prolan over a period of ten days. In the clinic Antophysin supplied by the Winthrop Chemical Company is used with considerable success. Frequently the treatment causes a local reaction in the arm and occasionally a general systemic reaction with temperature, chilly sensations, etc. Some patients object so strenuously to the treatment that they will not go on with it. On the whole, however, patients do not object and by coming to the hospital every day or every other day the total amount is given.

The treatment is given by preference when the patient is flowing but, if they are patients with the large period at normal interval type, the treatment is started ten days before the expected time for the catamenia. The response of the bleeding to treatment is occasionally extremely rapid, one or two days, and in others it is slow, ten to twenty days. If one series does not help the condition the treatment is usually repeated; sometimes as many as six to eight series are given. Lately because of the marked follicular activity seen in the operated cases the clinic has been reluctant to repeat the treatment too many times in young women. There can be no doubt but that many follicles are activated by this treatment and it is conceivable that an early menopause or sterility might be brought about by its continued use.

ANALYSIS OF CASES

The cases in this series are divided into four different categories of bleeding and an analysis will be presented of each group, then a survey will be made of the entire number.

TABLE I
Totals

Cases	59	Good result	54.2%
Continuous flowing	11	Good result	7
Too frequent periods	18	Good result	11
Continuous flowing after amenorrhea	17	Good result	8
Large regular periods	13	Good result	6

The first group consisted of those cases who, after a normal menstrual history, began to flow continuously. There were eleven cases with seven in the age group of twenty to thirty and the rest scattered from sixteen to forty-four. Sixty-six per cent of the married women had had children. Nearly all had a normal date of onset of their periods and seven had been regular up to the time of the present illness. There were seven excellent results and four poor results. These cases gave the best percentage of good results.

The second group was made up of those with too frequent periods. There were eighteen patients with sixteen in the ages between twenty and forty. Nearly all had a normal date of onset of their periods and 54.6 per cent of the married women had had children. Eleven cases had always had regular periods, five irregular and two too frequent. The duration of the too frequent intervals was months in five cases, years in seven and many years in six. Ten had intervals of two weeks and seven of three weeks and in one, the interval was not stated. Eleven of these patients were straightened out and seven were failures.

The third group consisted of seventeen cases

of continuous flowing after a period of amenorrhea, the typical metropathia hemorrhagica or Shaw type I. Eleven of the seventeen cases were in the ages between twenty to forty while two were just at the onset of the catamenia and three between forty and fifty. According to Wilfred Shaw's analysis of his cases in this group most were in the menopause age. Ten of this series had regular periods before the onset of their present illness, two were irregular, one too frequent, one had prolonged intervals and one prolonged periods. Of the married women 62.5 per cent had had children. The patients skipped on the average of two to three months before the onset of the abnormal bleeding. Eight had had curettages and of this group seven had pathological reports of endometrial hyperplasia. It was necessary to do a hysterectomy in three of these patients and but one had fibroids. In this series good results were obtained in but eight out of the seventeen cases. This is far below the percentage of good results expected, for as prolan causes luteinization a change from hyperplasia to premenstrual endometrium would seem easy. At the present time there is no good explanation for the failures.

The fourth group were those patients with regular but prolonged periods. In this group there were thirteen patients and eleven fell between twenty and forty years of age. Six were married and four had children, a percentage of fertility of 66.6 per cent. The onset in most all instances was at a normal time and all thirteen had regular periods. The present illness lasted months in four and years in eight, and in one the duration was not stated. Four patients came to operation and in three there were fibroids present. In six cases that had curettages or hysterectomies, hyperplasia was found. In this group there were six excellent results and seven poor results.

An analysis of the total fifty-nine cases shows that forty-seven were between twenty and forty and five were at the onset and six at the end of their menstrual life.

TABLE II

Ages	10-20	5	Good result	2
	20-30	23	Good result	10
	30-40	24	Good result	15
	40-50	6	Good result	1

This is rather a surprise as it was felt that many of the cases of abnormal bleeding occurred at the time of onset of the catamenia or at the climacteric. Interestingly enough the patients treated with prolan at the beginning and end of catamenial life responded about as all the others to treatment. Of the total number of cases there were but seventeen who were known to have had children, a percentage of only 28.6. Granting children to five women in whom the history did not specifically state that they had been pregnant the number of pregnant women is but 37.2 per cent. This seems to suggest that abnormal bleeding of the types described in this paper is most common in the patient with unused organs. It is interesting to speculate concerning this, for chronic cystic mastitis, cancer of the breast, cancer of the endometrium and tumors and cancers of the ovary are more frequent by percentage in the sterile than in the fertile. Perhaps marriage and child-bearing are an insurance against tumors and abnormal pathology in the genital organs. In the entire group thirty-five patients had the onset of their periods from twelve to fourteen, while in nine the onset was from sixteen to eighteen. The character of the periods from the onset was regular in forty-two and more or less abnormal in thirteen. In four this question could not be decided. In eleven cases curettages had been done and in no instance was the result a satisfactory, permanent one. In four cases with fibroids prolan was tried, with a poor result in three and a fair result in one. This is different than expected for bleeding fibroids frequently have the same pathology as the cases with metropathia hemorrhagica or Shaw's type I bleeding that gave good results in eight of seventeen cases or 47 per cent. These figures of course are too small to be of much value.

The good effect of the treatment lasted from three months to eighteen months and the bleeding often recurred after three or four months and would respond again to treatment. The treatment does not always give permanent results and after the cycle has been restored to normal the same causal factor continues to act and the abnormality recurs. This tends to enhance the belief that although prolan counteracts the abnormal from the time of its injection it is not a permanent corrector of the underlying pathology.

Of thirteen cases with an early onset of catamenia, eleven and twelve years of age, there were good results in eight and poor results in five. This is about an average for our series. Apparently there is no prognostic significance to early puberty.

There were six patients that had had an ovary removed previously for some pelvic pathology. In the treatment of these cases two obtained a good result and four a poor result. The removal of an ovary, if the uterus is left in, may have serious consequences so far as the remaining catamenial life is concerned. Some patients experience abnormal bleeding, and some severe dysmenorrhea. The occurrence of hyperplasia of the endometrium in animals has been brought about experimentally by the removal of one ovary.

In studying the effect of prolan treatment on the molimina, or premenstrual feelings of patients, the results obtained were not definite enough to be of any value. In some cases with

severe upsets, prolan was of help but in others of no help whatsoever.

Of the total number of cases treated with prolan thirty-two had good or excellent results and twenty-seven fair or poor, the percentage of satisfactory responses being 54.2. This is really a very good showing for these patients avoided serious surgery with satisfactory rehabilitation after a few injections in the arm. Inasmuch as most patients are between twenty and forty years of age, it is evident that prolan treatment is of great importance, for therapy with ergot, etc., is rarely satisfactory, radium or x-ray too likely to bring about an artificial menopause, and surgery best to avoid if possible. It must be clear to everyone, however, that it is not a cure for all cases of abnormal bleeding.

In twenty-five of the thirty-two good result cases, the patients were from twenty to forty years of age. This apparently is the proper time to treat these patients and is easily explained because of the probable responsiveness of the ovary at these ages. At the onset of menstruation the ovary has not established itself and at the menopause it is wearing out. Of these thirty-two patients but eleven had children, a percentage of fertility of 34.3. Six had had previous curettages and in one the bleeding stopped for eighteen months only to recur. In eighteen cases but one treatment sufficed to give a good result, in eleven two, in two three and in one four. It is apparent that if a good result is to be obtained it will be noticed early after treatment has been started. The catamenia became normal in from two to twenty days after treatment was commenced.

Of the poor results the percentage of fertility of the entire group was only 24. Nineteen of the twenty-seven patients were between twenty and forty years of age. There were eight cases that had had previous curettages without any permanent relief. The treatment was given but once in eight cases, twice in nine, three times in five, and six to fifteen times in three. Of the failures one was given radium later, one became pregnant (this should not be considered as a poor result but was not the result expected), three had fibroids at operation, two had cysts of the ovary, one had a hysterectomy and only hyperplasia of the endometrium found at operation, one had carcinoma of the body of the uterus and the last patient had a D & C which was of no use and the patient is still flowing.

In the metropathia hemorrhagica group, that is those cases with a follicle cyst, no corpora lutea and hyperplasia of the endometrium, of seven cases where a failure occurred, none had been pregnant.

Curettage is of no permanent value in this particular type of disease, because, after the curettage, just as after prolan treatment, the abnormal bleeding recurs in from three to six months. It is evident that there is some unknown underlying factor behind most of these cases of abnormal bleeding, and although prolan, like a curettage, may correct it for a time the fundamental pathology causes a recurrence of the difficulty. It is obvious therefore that much more study must be done upon the subject before we will be able to answer accurately what prolan does and how it acts upon the patient to check bleeding. It is equally obvious that much more study must be done upon normal controls to determine the fate of injected prolan and that then only can women with abnormal bleeding be intelligently treated.

CONCLUSIONS

In conclusion certain facts are apparent. More than 54 per cent of good results were obtained in a group once difficult to treat without radiation or surgery. The patients were nearly all from twenty to forty years of age; the percentage of child bearing was very low; fibroids did not seem to respond to treatment; the age of the onset of the catamenia was of no consequence; most of the patients had regular and normal periods before the onset of their present illness.

REFERENCES

1 Novak, Emil, and Hurd, Gerald B.: The use of an anterior pituitary luteinizing substance in the treatment of functional uterine bleeding. Gynec. Trans. 56: 146, 1931.
2 Smith, George V., and Rock, John: Dysfunctional uterine bleeding. Surg. Gynec. & Obst. 57: 100, 1933.
3 Schröder, R.: Die Pathogenese der Meno- und besonders der Metrorrhagien. Arch. f. Gynäk. 110: 633, 1918-1919.
4 Shaw, Wilfred: Irregular uterine haemorrhage. J. Obst. & Gynec. Brit. Emp. 36: 1, 1929.

DISCUSSION

CHAIRMAN O'CONNOR: The discussion of Dr. Meigs' paper will be opened by Dr. Frank A. Pemberton, of Boston.

DR. PEMBERTON: Dr. Meigs has given us a very good exposition of this subject, clear and sensible.

Our conception of this type of abnormal bleeding at the Free Hospital for Women is that it is due to a dysfunction of the endocrine system in which both the ovarian and pituitary glands, and the endometrium are involved. It is characterized in many cases by a certain type of hypertrophy of the endometrium and these various changes in the ovary and pituitary which have been mentioned. Corroborative evidence is the menstrual-like bleeding which occurs some years after the menopause has been established in cases which develop a granulosa cell tumor of the ovary. They show a hypertrophy of the endometrium probably arising from the atrophied stage found normally after the change of life as a result of renewed endocrine activity in the ovary and there is some autopsy evidence of changes in the pituitary. We do not know the actual chemical changes which take place and cause the bleeding. Since the pituitary is thought to control the ovaries, it is reasonable to regard it as the primary cause.

The Smiths and Rock at the Free Hospital have some biological experimental evidence that, while the

patient is flowing, her urine contains a substance which gives a prolan A effect in rats and that this substance disappears on treatment with the pituitary-like hormone obtained from the urine of pregnant women. If there is such a substance it may be an etiological factor in the bleeding.

As for the secondary causes of the flowing we think that the changes found in the endometrium, which Dr. Meigs speaks of as due to a breakdown of it, are more likely the result of extravasation of blood in the endometrium with an upheaval and tearing off of the outer parts of the tissue giving this picture of a slough. If slough alone were the cause it seems reasonable to suppose that the flowing would not be so severe as it frequently is and that the raw surface would heal over in two or three weeks at most, but some cases flow for weeks and months. There must be some other factor present to make the bleeding continue.

Our feeling regarding the action of the A. P. L. hormone in relieving these bleeding cases is that it acts directly in breaking up a prolan A-estrin bleeding combination, stopping the production of the bleeding factor, rather than through luteinization of the ovary with its effect on the endometrium. Geist and others have found that the administration of the A. P. L. hormone to human beings and animals causes hyperemia of the ovary with an arrest of follicular development rather than luteinization. Geist's experiments were done on human beings that had uncomplicated fibroid tumors of the uterus, that is, cases comparable to these abnormal bleeding patients. Rock has studied the endometrium before and after the use of A. P. L. hormone in bleeding cases in too few instances to be of much value yet, but has found no suggestion of a progestational hypertrophy such as one ought to obtain if there is effective luteinization of the ovary. Our figures on fertility are rather different from Dr. Meigs'. Up to 1929 we had 209 of these flowing cases 23 per cent of whom were unmarried. Among the married the per cent of sterility was 8, that is, the percentage of fertility was greater than in married women in general.

The Free Hospital for women has an endocrine clinic in which these patients are studied and treated by Dr. John Rock and Dr. George V. Smith. Fifty-five cases have been followed for from three to eighteen months and twenty-seven for less than three months. Of the former the treatment has been effective in 65 per cent, with relief in 13 per cent, and with failure in 22 per cent. The dosage of Ant. S. used has been nearly twice that of Dr. Meigs.

We do not fear to use radium in the cases that fail to respond, for it is rare to cause a permanent amenorrhea or sterility in our experiences. This depends on careful diagnosis and dosage. The use of high voltage x-ray is however likely to cause the menopause, but low voltage not.

We wish also to stress the importance of accurate diagnosis especially regarding cancer and pelvic inflammation as causes of the flowing. The latter is common. The former is so omnipresent in our minds that many of our cases over forty years of age are treated by an examination under anesthesia and the use of radium without first trying the A. P. L. hormone.

It is evident that this type of bleeding and the effect of the A. P. L. hormone require considerably more study.

CHAIRMAN O'CONNOR: The discussion will be continued from the standpoint of the internist by Dr. Charles H. Lawrence, Jr., of Boston.

DR. LAWRENCE: Dr. Meigs and Dr. Pemberton have so thoroughly covered this subject that, if I attempt to talk much about what they said, I shall simply make confusion. It appears to be clear from their remarks (and from my own experience, this is the conclusion I hold tentatively) that the results obtained from Prolan treatment are not due to a simple and temporary substitutive effect. The treatment has some sort of permanent effect if it has any, for from Dr. Meigs' charts you could see that, following one or two treatments, periods were regulated for a long space of time if not permanently. It seems to me that in that particular characteristic lies the usefulness and the possible danger in the employment of Prolan in the treatment of abnormal uterine bleeding; and that because of that danger we should be very careful, first, to study our cases thoroughly enough, be certain that a given patient needs Prolan; and secondly, to follow patients after treatment in order to determine the question of the permanence of the results. I want to report to you a small series of adolescent patients with abnormal bleeding, functional in character, who have been so studied and so followed.

This series consists of ten girls, all below twenty, whom I have had under my observation for a period of over two years, following their treatment with prolan so that its permanent effect seems to be fairly clear. In all of them the basal metabolism, sugar tolerance, complete blood examination, and, where indicated, x-rays and other measurements were obtained. Most of them began to menstruate at or after their fourteenth birthday, four began after their sixteenth birthday, and two after their fifteenth birthday. In most of them the interval between periods was abnormally long at the beginning, and the majority flowed very profusely, while three of the ten had begun to have flowing midway between two normal periods. It seems to me that that history practically always means hypoplasia of the pelvic organs. It was proved by examination in six of the ten girls. From our present knowledge this hypoplasia means hypofunction of the anterior-pituitary lobe. Seven of the ten patients showed basal metabolic rates between —10 and —20. Eight of the ten showed disturbed sugar tolerance. This combination of findings is highly suggestive of hypofunction of the anterior-pituitary lobe, and when it is combined with the menstrual history and physical findings which I have just described I should believe it a reasonable basis for treatment with prolan.

Because of the danger of overstimulating the ovaries, to which Dr. Meigs has called attention, it has been my custom to treat patients for two periods and then omit treatment during the next period in order to determine the effect. If that period was still excessive the same course of treatment was repeated. The number of the courses required and the amount of prolan necessary to control the period varied considerably with the individual patient. At the end of two years from their last course of treatment these patients are all menstruating normally, and those who had definite hypoplasia show evidence of more normal development of the pelvic organs as judged by pelvic examination.

These findings, it seems to me, offer evidence that the effect of prolan is permanent and that it is best described as a maturating effect. It, therefore, seems to me particularly useful in treatment of adolescent menstrual disturbances when pelvic hypoplasia and other evidences of hypofunction of the anterior pituitary are present. It is true that in some of these patients the spontaneous normalization takes place. If, however, it has not occurred by the sixteenth birthday, it seems to me that they deserve careful study and treatment with prolan. If treatment is too long delayed there will be a less satisfactory response. If it is carefully checked

there need be no overstimulation, and it offers hope of normal development and maturation of the pelvic organs with normal fertility as contrasted with a possible failure of spontaneous normalization resulting in permanent hypoplasia and lowered fertility if treatment is not given or is put off too long.

CHAIRMAN O'CONNOR: Is there any further discussion of Dr. Meigs' paper?

DR. S. C. GWYNNE, Worcester: I should like to ask Dr. Meigs two questions, if I may. First, as to the rôle of the secondary anemias in some cases of uterine bleeding. Is it not true that in some of these cases a secondary anemia is the cause and not the result of uterine hemorrhage, and that correction of the anemia will stop the bleeding from the uterus?

Secondly, would you say something about the use of prolan B in the cases of those uteri which repeatedly miscarry, the so-called irritable uterus?

Finally, I should like to caution against the too enthusiastic reception by us of the urge of the salesman to use these endocrine products in the treatment of all types of uterine dysfunction.

DR. BENJAMIN PARVEY, Boston: It is evident that the anterior-pituitary, the ovaries and the thyroid glands are interrelative quantitatively. It is a known fact that a deficiency of thyroid may be a cause of uterine bleeding. In such a condition of hypothyroidism, palliative treatment of thyroid therapy deserves trial. I have had several cases of this type in which such treatment has given gratifying results, whereas, with anterior pituitary therapy, (Antuitrin-S and Follutein), I have been able to control the bleeding only temporarily. One such case of metrorrhagia I have been able to control with thyroid therapy for the last eight months.

CHAIRMAN O'CONNOR: Is there any other discussion? If not, I will ask Dr. Meigs to close the discussion.

DR. MEIGS: I think that the question of what it is that causes a cessation of bleeding is a very difficult one to answer. From the study of ovaries, after prolan treatment, I feel that there is a luteinization taking place in the ovary, and I cannot help but feel that it is a very important factor. That there is a bleeding factor seems a possibility, and yet where luteinization or theca luteinization takes place as clearly as is evident in some ovaries, it seems to me it must be taken into consideration.

Dr. Lawrence's mention of cases with uterine bleeding and thyroid deficiency is important. I used to treat uterine bleeding in the Massachusetts General Hospital with thyroid and dried corpus luteum extract. Of twenty-six patients so treated fifteen had excellent results. I always believed it was due to a combination of both extracts and did not think it was due to the thyroid alone, but the more I learn about thyroid deficiency the more I believe there is some important connection and that thyroid will stop some of these bleeding cases.

Secondary anemia in menorrhagia is important. Dr. George Minot is very much interested in this aspect and I have seen some of his cases. Some are definitely relieved by the use of iron in large quantities. One patient referred to me by Dr. Clark Heath had had relief from severe secondary anemia and severe bleeding. At operation for a lacerated perineum and lacerated cervix I found a small cyst of the ovary. I believe she was in an amenorrheic phase and wrote Dr. Heath that I believed she would start bleeding again and my prediction came true. Finally after much prolan and iron it was necessary to operate upon the patient and she had a follicular cyst of the ovary and much hyperplasia of the endometrium. This is the typical pathology of some of these bleeding cases.

Dr. Gwynne, I cannot answer your question about early miscarriages, but it would seem logical to suppose that, if the corpus luteum is necessary in the early months of pregnancy, the use of the luteinization hormone to add support to its function seems reasonable.

CHAIRMAN O'CONNOR: It gives me special pleasure and I feel highly honored to be able to present to the Section the next speaker. The subject of his paper is "Fetal Birth Injuries with Special References to Intracranial Lesions." I am very happy to present to you Dr. P. Brooke Bland, Professor of Obstetrics at Jefferson Medical College, Philadelphia.

FETAL BIRTH INJURIES WITH SPECIAL REFERENCE TO INTRACRANIAL LESIONS*

BY P. BROOKE BLAND, M.D.†

INTRODUCTION

THE birth of a sound healthy baby is one of the most happy, as well as one of the most fortunate, events connected with motherhood.

On the other hand, the birth of a dead child or a neonatal death is almost invariably looked upon as an obstetric tragedy, though probably still more tragic is the birth of a child either hopelessly crippled or grossly deformed.

In considering injuries of the new born in general, it may be said at the outset that damage, slight, moderate or severe, may be sustained by any structure from the dermal covering—as for example the omnipresent caput succedaneum—to the mucous lining, including in the intervening area the muscles, blood vessels, nerves, bony architecture and the parenchymatous organs as well. It is thus observed that no tissue or structure is wholly immune.

The cutaneous envelope of the fetal body is exposed to abrasions, lacerations and necrosis, leaving at times telltale marks of an indelible nature. In certain instances skin damage is followed by bacterial invasion and occasionally this may culminate in death.

The bony framework, from the vertex of the cranium forming the upper pole of the fetal organism, as well as those structures forming the inferior pole, may be the site of the gravest form of damage.

*Presented at the Section of Obstetrics and Gynecology of the Massachusetts Medical Society, at its Annual Meeting, Worcester, June 6, 1934.

†Bland, P. Brooke—Chief of the Department of Obstetrics, Jefferson Medical College Hospital. For record and address of author see "This Week's Issue," page 329.

The vital organs within the thoracic cage, or those within the abdominal cavity, may, likewise, sustain damage of a disabling or even fatal type.

Of the various forms of fetal birth trauma, both as regards the immediate and remote results, injury of the cerebrospinal system is probably the most frequent and certainly in all respects by far the most serious.

Numerous investigators have demonstrated that pathologic conditions arising in the early days of neonatal life are largely dominated by injuries sustained by the brain during delivery.

FETAL MORTALITY IN AMERICA

In studying the statistics of fetal mortality in this country, it is exceedingly disquieting to learn that each year approximately 150,000 infants are born dead or die shortly after delivery. This means that 12,500 babies succumb every month, 2,885 every week, 410 daily, 17 every hour or approximately one every three minutes throughout the year.

In the light of modern knowledge, it is quite safe to claim that one-half or more of these fatalities follow intracranial damage. This carries the implication that there occur annually 75,000 deaths, or one every six minutes, from injuries of the structures within the cranial cap.

It is altogether likely that many deaths heretofore designated as neonatal and stillbirths, especially those ascribed to that symptomatic state, asphyxia neonatorum, really resulted from gross damage of the vital organs inside the cranial cavity.

Apart from injury of sufficient gravity to result in stillbirth or neonatal death, there remains a vast world of little children, as well as of individuals of various ages, with bodies or brains, or both, hopelessly and permanently deranged. Herein is found one of the lamentable tragedies of childbirth, for literally intracranial damage leaves in its wake an endless procession of the lame, the halt and the blind.

It is not possible to state definitely how large this group is, but it probably includes thousands; thousands of children with bodies frightfully maimed and brains partially or wholly bereft of function, thousands doomed to remain helpless babies both physically and mentally so long as they live.

According to Edgar A. Doll, it is estimated that one per cent of the total population of the United States is mentally deranged. This indicates that there are approximately 1,250,000 mentally deficient individuals in this country.

According to the author quoted, it is believed that one-half to two-thirds of these individuals, especially the institutionalized, are of the so-called hereditary or primary types. Ten per cent of the secondary types, it is claimed, are due to birth injury. This means that roughly 125,000 cases can be ascribed to injuries sustained at the time of delivery.

LITERATURE

In recent years fetal birth trauma in general, and trauma of the organs within the cranium particularly has been receiving some of the attention, long overdue, it actually deserves. Numerous articles have been published dealing with the trouble and, according to Ford, one of the first important contributions was made by Wehye, forty-six years ago, who recorded the autopsy findings in 959 stillborn babies. In these, intracranial hemorrhage was found in 122. Since the publication in 1888 of the observations of the author cited, an ever-growing literature has developed, though it is interesting to note that this has appeared largely during very recent years. In a series of references recorded by Ford, totaling 136, all except forty-nine of the articles have been contributed since 1910, and it is, further, interesting to observe that more than sixty of these papers appeared between 1920 and 1927.

In another series of sixty-four articles dealing with the subject, quoted by Doll, forty-eight were published since 1918.

While a few papers were contributed, one by Kennedy, in 1836, and another by Mauthner, in 1844, it was the notable article published by W. J. Little, of England, that directed special attention to the subject. This classical document was read at a meeting of the Obstetrical Society of London, on October the second, 1861, seventy-three years ago. It was entitled: "On The Influence of Abnormal Parturition, Difficult Labor, Premature Birth, and Asphyxia Neonatorum on The Mental and Physical Condition of the Child, Especially in Relation to Deformities." This is one of the most noteworthy contributions to scientific medicine of all time. It should be read and studied by every teacher, student and practitioner of medicine.

In his presentation, Little also referred to what he designated as his first paper, which was published seventeen years before.

The essayist probably had in mind the series of lectures eighteen in all—which he delivered On Deformities of the Human Frame, at the Hospital for the Cure of Deformities, London, in the year 1844. In lectures 8 and 9, the latter especially, there is outlined a detailed description of the clinical features of spastic rigidity, now commonly called Little's disease, of muscles and deformities in infants, young children and adults.

The author attributed certain forms of spastic palsy and mental derangement to asphyxia. Apparently he did not appreciate the fact, as we do to-day, that asphyxia was a symptom rather than a cause of damage within the cranial cap. Little quite properly assumed that asphyxia

was due to some interference with the placental circulation, and this he believed provoked the subdural and other types of intracranial hemorrhage. Although he does mention mechanical injury as a cause of spastic palsy, he evidently had no knowledge of, nor did he realize, the part played etiologically by primary obstetric damage within the fetal skull.

In his contribution he had shown that mechanical injuries of the head and neck following premature birth and difficult labor, in those instances where fetal life was preserved, though convulsions followed delivery, that the latter convulsions were apt to be succeeded by a determinate affection of the limbs of the child. This he designated spastic rigidity and ascribed as the cause "asphyxia neonatorum".

A feature of absorbing interest in connection with the study is found in his statement that medical writers of the period seemingly were unaware that abnormal parturition, ending in recovery of the child, at times terminated in diseases or conditions that manifested themselves in a remote stage of life.

In closing the discussion of his paper, he stated that he was not able to find any references to birth injuries with their sequelae in the works of English medical writers. He, therefore, with confidence referred, he said, to Shakespeare and there he discovered the description of the physical deformity of King Richard the Third. This fitted precisely an individual afflicted with one kind of deformity originating at birth.

It is of interest to mention also in this connection that Sir Thomas Moore refers to the character of the birth of King Richard. His mother, the Duchess of Gloucester, Sir Thomas states, "had much ado in travail and that Richard was born with the feet forward," in other words as a breech delivery. It is pertinent to mention, also, that his birth was premature.

King Richard, in lamenting on his condition, is made in Act I by Shakespeare to say:

> "But I that am not shaped for sportive tricks,
> Nor made to court an amorous looking-glass;
> I, that am curtailed of this fair proportion,
> Cheated of feature by dissembling nature,
> Deformed, unfinished, sent before my time
> Into this breathing world, scarce half made up,
> And that so lamely and unfashionable
> That dogs bark at me as I halt by them;
> Why, I, in this weak time of piping peace,
> Have no delight to pass away the time,
> Unless to spy my shadow in the sun,
> And descant on mine own deformity."

FREQUENCY

In a study of the literature regarding the frequency of intracranial injury, one naturally finds, as always, some discrepancy in the data recorded. Autopsy studies, according to Ford, disclose that the incidence ranges from 20 to 65 per cent. In certain conditions, as, for example, premature and immature babies, a much higher percentage is found and it has been determined that a varying degree of intracranial bleeding is present in 90 per cent of the cases associated with the condition named.

This confirms the general assumption that prematurity and immaturity are very intimately related to intracranial bleeding in an etiologic way.

It may be pertinent to mention at this time that in sixty-three cases of spastic rigidity and allied conditions recorded in that classical contribution of Little, the obstetric maternal histories refer to prematurity or complicated labor in nearly all.

Breech presentations, as already indicated, are accompanied by a much higher percentage of gross trauma with hemorrhage inside the cranial cavity than are vertex presentations.

During the past eight years, in my own clinic, intracranial hemorrhage has been responsible, as confirmed by postmortem investigation, for 14 per cent of our stillbirths and 13 per cent of our neonatal deaths. In other words, during this time, intracranial injury with hemorrhage we found was responsible for 27 per cent of our fetal mortality.

I am persuaded, however, that these figures do not represent the total percentage of the fatal causes of intracranial hemorrhage arising in our clinic. There were others, fetal deaths which I believe were unmistakably due to intracranial damage, but in these we were denied the opportunity of conducting autopsy investigations.

Apart from those cases of intracranial trauma of sufficient gravity to result in death, there are, besides, numerous instances in which injuries of a minor extent and unassociated with symptoms occur. Hemorrhage of varying degree is found in these babies. Indeed, it has been demonstrated by Sharp and others that routine spinal paracentesis of all new born babies will reveal the presence of certain quantities of blood in approximately 10 per cent of the patients. Ford claims that a very large percentage of babies dying during delivery, or shortly thereafter, show frank evidence of intracranial hemorrhage at autopsy. This opinion is shared by nearly all present-day observers. In only about one-third of the infants affected, however, is the bleeding of such proportions as to result in death.

MORBID ANATOMY

Passing on to the question of the morbid findings in cases of intracranial trauma, two conspicuous lesions of varying intensity usually are found: First, laceration of the dura mater septa and, secondly, hemorrhage. In a certain number of instances, especially in the premature, bleeding is sometimes found without meningeal

damage and conversely injury of rather extended proportions of the membranes with bleeding wholly absent may, also, occasionally be observed.

Holland, in analyzing 167 fresh fetuses, found the tentorium cerebelli lacerated in eighty-one or 48 per cent. Laceration of the falx cerebri was found as an accompaniment in five of these specimens, but in spite of the extensive trauma, bleeding was wholly absent in six of the bodies examined.

SITE OF INJURY

With reference to the site of injury, we learned from our investigations that this may occur in almost any section of the dura mater septa, though in most instances we, as have Holland and many others, found that the tentorium cerebelli, just below or near its union with the falx cerebri, is most frequently damaged. Laceration may involve one or both sides of the tentorium and the tear may be incomplete or complete. In a certain number of instances, as has already been mentioned, injury of the falx is an accompaniment.

The configuration of the lacerations is variable. Some appear as simple slits. Others are found elliptical in outline. Some appear as oval perforations (fenestra) and still others as irregular ragged rents.

Laceration of the septa is nearly always associated with an outpouring of blood and this may be mild, moderate or severe. While laceration without hemorrhage occasionally occurs, this is observed only in exceptional instances. In the majority of cases, vascular damage is an accompaniment of injury of the membranes and at times venous trunks of large dimensions are torn.

Capon, quoted by Ford, found in an autopsy study of eighty stillborn babies the source of the bleeding as follows:

First, the cerebral veins near their terminations in the superior longitudinal sinus.

Secondly, the internal cerebral veins, the choroidal veins particularly and almost exclusively in premature babies.

Thirdly, the small nameless veins coursing through the fibers of the tentorium.

Fourthly, the tributaries of and occasionally the chief trunk of the vein of Galen.

Fifthly, the superior longitudinal, the transverse and the straight sinuses occasionally.

In the main, however, it is the veins of small dimensions that are involved.

Holland, from his observations, believes that the principal sources of hemorrhage are from the tributaries which the vein of Galen receives from the cerebellum and midbrain and, also, from the cerebellar veins which enter the straight sinus.

The quantity of blood effused is variable. It may be mild, moderate or profuse. In cases of severe injury the brain at times becomes literally flooded with blood.

Profuse hemorrhage, however, does not seem to be absolutely essential, in order to result in a fatality. Minute hemorrhage may be culpable. Microscopic bleeding, it has been demonstrated, is sometimes responsible for stillbirths and neonatal deaths.

For example, in fifty-three unselected cases, Hemsath and Canavan found in their autopsy studies, especially in the region of the medulla, thirty-four instances (64 per cent), areas of microscopic hemorrhage. In twelve of the babies examined these findings provided the anatomical cause of death, which otherwise would have remained unsolved. The investigation carried out by the authors mentioned confirms the view of Crothers, who has pointed out that damage of the medulla is the predominate factor in birth trauma.

MECHANISM

Injury of the dura mater septa together with the vessels is brought about by intracranial stress and its mechanism, as described by Holland, and is rather widely accepted. Intracranial stress is defined as a compound compressive stress which roughly may be regarded as consisting of two elements: first, a general compression of the whole brain and, secondly, a simple longitudinal compression by opposite forces acting at the ends of the long diameter of engagement of the head in the pelvis. With these forces operative, there is brought about alteration in the contour of the fetal head, together with overstretching of the septa of the dura mater. (Holland.)

For instance, in vertex cases and in the aftercoming head in breech presentations, the anteroposterior diameter of the head is decreased, while the vertical diameter is increased. This alteration results in overstretching with attenuation of the falx, particularly at or near its point of junction with the tentorium, and it is in this region that gross damage most frequently takes place.

In face and brow presentations, there is a decrease of the vertical with an increase in the anteroposterior diameter of the head and this naturally brings about elongation and stretching in the lower free borders of the tentorium and falx. Hyperattenuation in these circumstances must inevitably result in lacerations with fatal termination in a certain number of instances, and to a degree hitherto wholly unsuspected.

PREDISPOSING FACTORS

The consideration of the etiology of intracranial damage would be wholly incomplete

without some reference to the factors chiefly concerned in a predisposing way.

These briefly may be summarized as follows:

First, it has been demonstrated that parity is influential in a certain number of instances, because it has been observed that the accident is considerably more frequent in the first than in subsequent labors and this is especially true with the birth of male children.

Secondly, intracranial damage, it has been found, is prone to occur in prolonged and difficult labor, as is encountered in contracted pelves with delivery occurring either spontaneously or otherwise.

In this connection it should be mentioned parenthetically that judicious instrumental delivery seems to be far less likely to be followed by intracranial damage than in unwisely governed spontaneous labor. It is the long, unduly drawn-out stress of spontaneous and not the relatively short stress of forceps delivery that is most likely to inflict damage of a serious character intracranially.

Thirdly, predisposition naturally is favored in technically difficult and imprudent forceps delivery.

Fourthly, it has been found that in complicated breech delivery, especially in cases associated with hasty, unskilled extraction of the after-coming head that damage is especially likely to occur. This method of delivery is regarded as accountable in a large number of instances of brain injury. (In the 168 fetuses examined by Holland, breech delivery was held as causative of intracranial damage in forty-seven.) In this series, laceration of the tentorium cerebelli was found in thirty-seven cases, or in approximately 75 per cent.

Fifthly, the lesion is, also, far more frequent in premature and immature infants, due, first, to the fragility of the blood vessels, and, secondly, to incomplete anatomical development of the strengthening fibers of the tentorium. Prematurity and immaturity must, therefore, be looked upon etiologically as among the chief predisposing factors.

Sixthly, in difficult delivery of the after-coming head following version. This is operative, it has been found, in a large number of instances and, hence, accounts for a certain number of cases in a predisposing way.

Seventhly, the indiscriminate use combined with excessive dosage of pituitrin to stimulate uterine contractions in the second stage of labor has been a rather potent source of damage of the brain and its enveloping membranes in a definite number of cases.

Eighthly, biochemical changes in the blood, as well as constitutional disease, syphilis for example, have been mentioned as predisposing, but these conditions are by most observers not credited with special etiologic importance. However, it seems reasonable to assume that a hemorrhagic tendency verging on the pathological may become a factor of predisposition in some cases.

As a matter of record and interest, the recital of some personal observations made in my own clinic, as regards operative delivery, might not be amiss at this time.

In 4,631 consecutive deliveries there occurred forty-nine fatal cases of intracranial hemorrhage, a fetal mortality from this source of about 1 per cent.

The character of labor in relation to the fetal mortality is portrayed in the following table:

Total Number with Character of Cases Delivered		Number of Cases of Intracranial Hemorrhage	Fetal Mortality
Spontaneous	4020	14	.3 per cent
Forceps	382	13	3.4 " "
Breech	174	11	6.3 " "
Version	55	11	20 " "

For fear of consuming more than the usual period of time allotted for this presentation and trespassing thereby on the time set aside for general discussion of the topic, it is obviously not possible to consider many other intimate and important features of the problem.

With reference to the symptomatology and diagnosis, I can only in a very brief way mention that intracranial damage is characterized by a rather sharply defined clinical portrait, delineated by an apathetic listlessness, perturbed respiratory function, cyanosis varying in intensity and duration, nystagmus, especially in severe cases, of an impressive and arresting type, a firm, tense, bulging large fontanel, convulsive seizures of the Jacksonian type, flaccid palsy in the muscles affected with convulsive seizures, indifference or refusal to nurse, an appealing, plaintive cry, dysphagia (20 per cent), and a varying degree of temperature.

With a clinical profile so typical, especially one combined with a history of primiparity, a large male child and a tedious, difficult delivery, spontaneous or instrumental, the diagnosis should be made forthwith. Indeed, with symptoms of the mildest sort, or no symptoms at all, following a difficult, complicated delivery, the possibility of intracranial injury should always be called to mind. Confirmation of one's suspicions in a rather clinical clear type of case, or in one of a suspected nature, is readily made by spinal puncture.

With reference to the remote sequelae of intracranial damage, with or without hemorrhage, I feel it incumbent to once more follow the dictates of brevity and simply say that gross injury of the delicate structures within the fetal skull, unless successfully counteracted, inevitably leads to cell destruction with altered function, both physical and mental, of a permanent character.

Notwithstanding the observation that there is still some controversy as to the etiological relationship of birth trauma (intracranial injury) to various neuropsychiatric states, including the spastic paralyses in children with or without amentia, it is, nevertheless, most significant that in all or nearly all children illy organized one finds, in a large number of instances, a history of prematurity or difficult labor, or both.

In the literature dealing with the spastic paralyses of children, there are mentioned generally three etiological factors: (1) mal-development of the neurones; (2) inflammatory processes as found in encephalitis, and (3) most conspicuous of all, destruction of the neurones from minor or gross hemorrhage.

It seems clear that severe injury is quite capable of bringing about sequelae of a serious nature.

Doll claims that, all possibilities considered, the following position in regard to birth injury seems justifiable:

"1. While it is at present difficult to reach any conclusions as to the actual percentage of children with neurological and mental handicaps who owe their defects to injury at birth, it yet seems generally agreed and reasonable that some children do survive cerebral hemorrhage and carry through life the marks in varying degrees of neurological disorder and mental retardation.

"2. That such cases are probably more frequent than has been realized heretofore is the trend of the most recent and authoritative investigators. This is because of the tendency of the early physical symptoms to clear up and be forgotten, and when the defective development is observed at six or seven months of age, it is often assigned to some other cause.

"3. It appears reasonable and probable that cerebral hemorrhage of degrees insufficient to cause death and even insufficient to permit detection in the early behavior of the infant, due to lack of development of the cortical cells at that time, is yet sufficient to obstruct normal development and show in later deficiency.

"4. While the motor disturbances, particularly spastic paralysis, are unquestionably the direct result of the hemorrhage in these cases, there is yet room for question in any particular instance, whether the mental retardation is directly related to a widespread process of cell destruction which also caused the paralysis, or whether the mental deficiency is caused by the restrictions in ideational expressions which the paralysis imposes.

"5. It does not appear unlikely that injury which does not affect the motor areas may simulate other forms of cerebral deficiency and be mistaken for primary amentia of any degree from moronity to idiocy.

"6. Birth hemorrhage may now and then be responsible for hydrocephalus, though this is probably rare.

"7. Secondary epilepsy may be one of the results of cerebral hemorrhage. (Stratling states, 'that the old lesions of an infantile cerebral hemiplegia are among the most frequent found in the brains of epileptics and further: We are reasonably safe in saying that fully 40 per cent of all the cerebral hemiplegics of infancy ultimately become epileptic'.)

"8. It is more than likely that a cortical hemorrhage which does not affect the motor centers may be responsible for personality deviations, especially noticeable in distractibility and irritability."

MANAGEMENT

Passing on to the therapeutic management of intracranial injury as encountered in everyday practice, the most dependable of all measures is prevention and this may be summarized as follows:

1. Scrupulous antenatal supervision with the view of recognizing and eliminating complicating conditions which may lead to serious difficulty at the time of labor, recalling in this regard the age old axiom, "to be forewarned is to be forearmed".

2. The avoidance of undue intracranial stress from the imprudent use of oxytocics, as for example pituitrin.

3. The evasion whenever possible of all difficult manual and instrumental deliveries and the performance, in all threatening cases, of elective abdominal delivery instead.

4. The avoidance in all cases of hasty, antiquated manual means in the extraction of the after-coming head in breech cases.

5. The routine employment of the Piper Forceps in the delivery of the after-coming head in all difficult breech deliveries, and in the extraction of the after-coming head following the operation of version.

6. The stimulation of respiratory function by the administration of carbon dioxide and oxygen in all new born babies showing signs of respiratory embarrassment.

7. The regular practice of cisternal or spinal paracentesis in infants subjected to undue cranial stress in prolonged, difficult and complicated labor.

8. The repetition of cisternal or spinal paracentesis once, twice, or even thrice daily, by trained hands, in all infants showing free blood in the spinal fluid.

9. The intragluteal or intraperitoneal injection of human blood, 10 to 20 cc., in all new born babies displaying symptoms and signs of intracranial trauma with hemorrhage.

10. The maintenance of fluid balance by the hypodermoclytic administration of saline solution with glucose 5 per cent, in quantities of 20 cc. repeated every four or six hours.

As a means of emphasizing the importance of prophylaxis in the therapeutic management of intracranial damage of the fetus, may I finally direct attention to the phenomenal achievements which have followed the institution of preventive resources in certain types of organic disease.

In tuberculosis, for instance, the attainments have been almost unbelievable and only recently a renowned authority, Dr. Lawrence F. Flick, stated that within the short span of twenty years tuberculosis will be unknown in the City of Philadelphia. This, of course, applies to the country as a whole.

Unhappily thus far no concerted or effective efforts have been made to overcome the frightful mortality and still worse the harrowing disability resulting from injuries of the fetal brain of the new born, although gross damage of the fetal cranium with its contents is far more amenable to preventive means than is bacillary infection of the lungs.

When this gradual growing conviction becomes widely known, and prophylactic methods become thereby more zealously practiced, would it not be logical to assume that grave intracranial injuries of our posterity would likewise become if not wholly eliminated, almost unknown? " 'Tis a consummation devoutly to be wished."

DISCUSSION

CHAIRMAN O'CONNOR: I am sure we are all grateful to Dr. Bland for his splendid paper and the excellent picture which he showed us. In the absence of Dr. A. K. Paine, of Boston, Dr. James R. Miller of Hartford will open the discussion.

DR. MILLER: I am taken a little by surprise by the Chairman in having this honor placed upon me. I enjoyed very much this detailed description by Dr. Bland, and since your Chairman spoke to me I have been thinking what I might say about it.

I feel that there are none of us who have made the diagnosis in some of our children of intracranial hemorrhage, but have been faced with the feeling that perhaps it would be better if this child might pass away. Certainly that feeling might be justified in some of the massive hemorrhages due to real trauma; but I think there is considerable hope for us in some of the lesser degree hemorrhages in the cisternal puncture. The spinal puncture, even as a diagnostic method, has not been used in Hartford for the last five or six years. We have done everything by cisternal puncture, using it daily eight or ten times, and some of the children who showed even a spastic condition (convulsions) and appeared to be hopeless cases, have been followed to cure and for four, five or six years after birth without signs of mental deterioration.

I think a word of caution might be said also in ascribing to another doctor, who has delivered the case, undue trauma at birth. Certainly some of these cases will develop spontaneously even in multiparae, and we should always be on our guard against that form of spastic paralysis which is the true Little's disease. I think that some of the marked bilateral spastic paraplegias may be of this type, and there has been quite a little discussion among pediatricians in controversy on that point.

CHAIRMAN O'CONNOR: The discussion will be continued by Dr. Richard S. Benner of Springfield.

DR. BENNER: We have all enjoyed Dr. Bland's paper in which he has so clearly shown the necessity of lowering fetal mortality by more judicious obstetrics.

With medical science advancing rapidly and showing a decrease in mortality and morbidity in most diseases, fetal mortality is still appallingly high. Although the obstetrician is often unjustly accused for every defect an infant or child may develop in its growth, he is, however, responsible for certain intracranial injuries as a result of unwisely conducted labor.

It seems to me that infants who account for the greater part of the mortality group fall into three main classes, as follows:

1. The premature and poorly nourished babies with their susceptibility to cerebral hemorrhage and other diseases. These present not so much a problem of childbirth as one of proper understanding of the mother's condition during pregnancy in relation to chemistry of the body and especially of the glandular secretions. This group is a field which offers opportunity for further study.
2. In the second class are the babies with hemorrhagic diathesis, whose first symptom may be a cerebral hemorrhage. How can we save these babies unless we inject whole blood into all newborn babies? While this procedure has been advocated by some obstetricians, it has not been generally adopted as a routine by many.
3. In the third class are the infants injured at birth. This is the important class, the one in which the obstetrician can help reduce the mortality and morbidity. The conservative obstetrician is the one who obtains the best results, yet conservatism must not be carried to the extreme.

An unnecessary induction of labor especially if the infant is premature has been the cause of many a cerebral hemorrhage. We have all lost babies due to a patient's rapid labor and have keenly regretted the omission of anesthesia to slow the contractions. Such labors are as disastrous as those from pituitrin.

Many infants have been lost or injured by a long second stage. Low forceps delivery has saved many lives, and the advent of the low Caesarean has relegated to the past the high forceps with its attendant infant mortality. The management of breech presentation is better understood than formerly and with the aid of the Piper forceps and slow delivery of the after-coming head, the future generation will benefit from the sad experience of the past.

Although version is a most useful procedure in selected cases, its promiscuous use has helped to fill our institutions for the feeble-minded.

CHAIRMAN O'CONNOR: The discussion will be continued by Dr. Randolph K. Byers of Boston.

DR. BYERS: *Mr. Chairman*—It has been a great pleasure to listen to Dr. Bland's paper. There are just a few remarks I should like to make about it, more from the point of view of one who sees the result of these injuries some time after they occur,

rather than from the point of view of one who has anything to do with the actual delivery of the patients.

Some years ago I took charge of a clinic at the Children's Hospital which was conducted in the hope of treating children who had been injured at birth, and I might say in regard to Dr. Bland's procession of "the lame, halt, and blind", that this clinic has become a very large proposition. We have no trouble at all in maintaining the clinic with children. We do not go looking for them. We are trying usually to keep them out, for we have more than we can handle.

As to the morbid anatomy of these children, I think the fundamental disturbance is unquestionably the tear of the tentorium, but results other than hemorrhage can occur. The tentorium acts largely as a stabilizing factor which prevents displacement of the intracranial content during delivery. Once the tentorium is torn, the intracranial contents become more mobile and herniation of the medulla into the foramen magnum becomes possible. Furthermore, this mobility of the brain puts a strain on the vein of Galen, displaces it, and kinks it, so that there is an interference of the blood supply to the basal region of the hemisphere. To us, as we see the children who survive these injuries, this seems to be one of the very common types, because those children who survive are the children such as the first you saw in the film, the children with choreiform movements and inability to perform useful activities because of the total lack of control of their extremities. Among the survivors bilateral spasticity, to which the name "Little's Disease" is given, is much less frequent, many more of them having the so-called extrapyramidal cerebral palsies. It seems to us that the cause of this is interference with the circulation through the vein of Galen, because cell death in the region drained by this vein would produce this type of motor disturbance.

As to the mental effects, we are getting more and more information about them. They are often extraordinarily subtle. Children will seem bright, responsive, and intelligent in all that you can learn about them in the first few years of life, that is, these children with these motor defects, only to fail thoroughly when they come up against school work. They are unable correctly to interpret and remember differences in shapes so that when it comes, for instance, at the age of four to get the children to put together picture puzzles, triangles or fill holes in boards, they do not put them together with the facility that normal children do. When the child gets to be six or seven and you try to teach him his letters, he cannot remember them from one minute to the next, and you are up against a perfectly hopeless teaching problem. We have not found any technique for teaching these children, although many of them are bright, responsive, socially pleasant and agreeable.

As to the prevention, it seems to me one thing further needs to be said. The use of carbon dioxide and oxygen is, of course, a palliative in very many of these cases; but, if the child's lungs are not expanded, the carbon dioxide and oxygen cannot go into the lungs and from there into the blood. In such instances compression of the chest does no good. It is not the same as with the adult where the chest contains air. No air has entered these lungs in many cases, and compression of the chest simply pushes into the circulation a large volume of blood which might easily leak from a slight tear in the tentorium. On the other hand, if children were treated in an apparatus like the Drinker respirator, the chest is expanded by negative pressure inside the respirator so that the normal movement of the chest is simulated, and in that way no tremendous volume of blood is forced into the circulation at least, and the alveoli of the lungs are distended. Since this method has been generally used in the Boston Lying-In Hospital, the incidence of intracranial hemorrhage has declined very markedly.

CHAIRMAN O'CONNOR: Is there any further discussion of Dr. Bland's paper?

DR. ROY J. HEFFERNAN, Boston: Dr. Bland in his excellent essay has told us that gross intracranial injury with resulting hemorrhage can be prevented only by better obstetrics. But what of that rather large group of cases, mentioned by Dr. Miller, in which intracranial hemorrhage develops, on the second, third, or fourth day of life, following a normal spontaneous, or easy low forceps delivery, where the baby has been subjected to a minimum of trauma? I believe these can only be explained on the basis of a blood dyscrasia, and this opinion has been substantiated by the findings of many careful investigators with relation to the coagulation of blood in new-born infants.

Lucas of the University of California, in 1922, reported a large series of complete blood examinations in the new-born. A deficiency of prothrombin was an almost constant finding. This he believed is due to a qualitative defect of the blood platelets. Rodda of Minnesota, Beveridge of Glasgow and others, have found a delay in the coagulation and bleeding time in the majority of new-born infants during the first three or four days, due, in all probability, to the lack of prothrombin. This deficiency should be remedied early, by supplying prothrombin to the infant. If you wait until the child shows definite signs of intracranial hemorrhage, gross injury will have already resulted and treatment will not be entirely effective.

It is much more logical to correct this deficiency in the blood of the new-born infant by the injection of 20 cc. of whole blood routinely in every infant immediately after delivery. Then these fine capillary bleedings that begin insidiously and continue until a real intracranial hemorrhage results will be prevented at the start. Whether this small amount of blood, 20 cc., supplies the needed prothrombin directly, or stimulates the production of prothrombin by the infant, or restores the prothrombin-antithrombin balance, is difficult to determine. But I do know that clinically it prevents intracranial and other hemorrhages in new-born infants.

I therefore urge, as I urged two years ago, before this Section, a routine adoption of this procedure. I have used it, to date, in 1426 cases. There has been no case of hemorrhagic disease in this group. There have been but six babies who showed signs or symptom or intracranial hemorrhage, and these all made an apparently complete recovery, except in one instance, after a Caesarean section and that baby died.

It is a simple procedure, it causes no untoward reaction in the baby and I believe its more general adoption would prevent many of the tragedies Dr. Bland has described to us today.

CHAIRMAN O'CONNOR: As the time allowed for this paper and its discussion has already been exceeded, I shall ask Doctor Bland to close the discussion.

DR. BLAND: I have enjoyed very much being here and participating in your scientific program. I enjoyed especially the discussion of my paper by the various members of the Society. Doctor Benner has inquired about the method we use in draining the spinal canal. This, of course, is done by paracentesis with the specific view of, first, confirming or establishing a diagnosis, and, secondly, with the view of relieving intracranial pressure. This work is carried on by a man especially trained in the technic

of spinal drainage. He has charge of our nursery in general and directs the care of all babies from the time of their birth until they leave the hospital. I might say that in draining the spinal fluid, he routinely does a cisternal rather than a spinal puncture. The remarks made by the last speaker, I feel, are of extreme importance and should be kept constantly in mind. We, too, are practicing more and more the method he advocates, and I am rather persuaded that we shall use it routinely in all newborn babies subjected to the stress of prolonged, difficult labor. It has been, indeed, a great pleasure to meet with you here to-day.

CHAIRMAN O'CONNOR: The next paper is entitled "Radium Therapy in Uterine Hemorrhages of Benign Origin. An Analysis of the End-Results of 150 Consecutive Personal Cases." I take great pleasure in introducing Dr. Louis E. Phaneuf, of Boston, who certainly needs no introduction to this audience.

RADIUM THERAPY IN UTERINE HEMORRHAGES OF BENIGN ORIGIN*

An Analysis of the End-Results of 150 Consecutive Personal Cases

BY LOUIS E. PHANEUF, M.D.†

RADIUM, in the early part of this century, was introduced in gynecology as a valuable agent in the treatment of cervical cancer. It soon came to occupy an important place in the therapy of non-malignant or benign uterine lesions, the chief symptom of these lesions being hemorrhage. This element, therefore, finds its greatest field of usefulness in small fibromyomas and in menorrhagia and metrorrhagia in uteri presenting no gross macroscopic lesions. Hypertrophy and hyperplasia of the endometrium are prominent in this group. Benign uterine hemorrhages may be divided into three classes according to the ages of the patients. (1) The hemorrhages of adolescence and of young women; (2) the hemorrhages of middle life and of the menopause, and (3) the hemorrhages occurring after the menopause. The second group, comprising the bleeding occurring during middle life and at the menopause, is found markedly in excess of the other two and it is in this class that radium plays its most prominent rôle. Before the common use of this radioactive substance, one or more curettages having failed, hysterectomy was resorted to. The women who applied for treatment, frequently in a state of severe secondary anemia and considered poor surgical risks, had to be prepared by one, and sometimes two blood transfusions before being subjected to an intervention as extensive as the ablation of the uterus. The period of convalescence following this procedure generally averaged about four weeks. While series of one hundred and more hysterectomies, without fatalities, have been reported, it is conceded by most authorities that the mortality of this operation in the hands of experienced surgeons varies between two and three per cent for the subtotal and somewhat higher for the total removal of the uterus. It is, of course, much higher in the hands of those who only perform this operation occasionally. Radium used for the same conditions, when properly employed, should have no primary mortality, and, if it does, it is strikingly less than that of hysterectomy. In the case of radium the period of hospitalization is about three to four days and, in the case of hysterectomy, about two weeks. These two factors impressibly favor radium therapy.

The main contraindications to radium therapy are large fibromyomas, inflammation of the adnexa and ovarian tumors.

In fibromyomas, radium may be used as a curative agent in the smaller tumors. In the larger tumors it may be used as a palliative agent, to arrest hemorrhage, to allow the patient to improve in health and to permit the performance of a hysterectomy at a later date under safer conditions. Subserous, pedunculated fibromyomas are but little affected by radium, while, in the submucous type of tumor, necrosis and sloughing occur, increasing the amount of bleeding for the time being. The best results from radium therapy are obtained in the intramural or interstitial neoplasms. The age of the patient is of prime importance in the selection of treatment for fibromyomas. In young women myomectomy, with the conservation of the functions of menstruation and of reproduction, should be the ideal procedure whenever applicable. A fundic hysterectomy, retaining a sufficient amount of endometrium to permit menstruation, when the function of reproduction has to be sacrificed, should receive the next consideration. A subtotal hysterectomy, in the presence of a healthy cervix, and a total hysterectomy when this organ is the seat of severe lacerations and inflammation, with the conservation of one or both adnexa, should be resorted to when the tumors are voluminous or too numerous to permit the performance of myomectomy or fundic hysterectomy. After the menopause both tubes and ovaries should be ablated with the uterus. In the younger group of women, radium is employed only when there are definite constitutional contraindications to surgical intervention. At or after the menopause radium may be selected for the tumors not exceeding a three months' pregnancy in size and for the poor surgical risks, while surgery

*Read before the Section of Obstetrics and Gynecology of the Massachusetts Medical Society, Worcester, Massachusetts, June 6, 1934.

†Phaneuf, Louis E.—Professor of Gynecology, Tufts College Medical School. For record and address of author see "This Week's Issue," page 329.

may be employed when opposite conditions obtain.

The successful use of radium in the treatment of benign hemorrhagic uterine lesions depends on the ability to perform an accurate bimanual pelvic examination ruling out adnexal infection and inflammation as well as ovarian neoplasms.

An examination of my personal records from April 2, 1927 to December 4, 1933 shows that I have treated one hundred and fifty consecutive cases of uterine hemorrhage of benign origin with radium, during this period of approximately six years and eight months.

TABLE I

The 150 cases are classified as follows:

Fibromyomas	27
Uterine hemorrhages of adolescence and of young women	8
Uterine hemorrhages of middle life	104
Uterine hemorrhages after the menopause	11
Total	150

TECHNIC OF APPLICATION

A laxative is given the day before and a soapsuds enema the evening previous to operation. The vulva and vagina are scrubbed with liquid green soap and irrigated with a solution of potassium mercuric iodide 1-1000. One of the methods of dry preparation may be used if preferred. The cervix is exposed, its anterior lip grasped with a suitable vulsellum and, in the presence of a cervical discharge, the cervical canal is swabbed with tincture of iodine, 3½ per cent, applied on a cotton wound applicator. The cervix is gently dilated and the uterine cavity curetted. A diagnostic curettage, with histologic examination of the curettings, is performed in all cases in order to rule out malignancy. The radium applicator consists of a brass tube 5 cm. in length and 1 mm. in thickness, into which is disposed 50 mg. (0.050 Gm.) of radium in the form of radium sulphate. The brass tube, at the end of which a fine nonrusting wire is attached, is covered by a thin rubber sac 0.5 mm. thick. The tube is placed in the uterine cavity and usually occupies its whole length except in the case of fibromyomas. This apparatus filters out the alpha and the beta rays and allows gamma radiation. The vagina is firmly packed with plain sterile gauze. In order to avoid secondary radiation, medicated gauze, such as iodoform and xeroform, is never used. A self-retaining catheter is introduced into the bladder and the patient is returned to bed. During the period of radiation she remains quietly in bed, in dorsal decubitus, to prevent disturbing the apparatus. The radium is left in for a definite number of hours according to the dose which is necessary. Thus, if the radium is left in for thirty-six hours, the dose would be 1800 mg. hours. She is placed on a liquid diet, including milk, and, when necessary, morphine sulphate or pantopon, in appropriate doses, is prescribed for pain and insomnia. The patient may be allowed out of bed the day the radium is removed or, if she prefers, the following day. During the period of radiation there may be a certain amount of nausea, rarely is emesis present, and occasionally there may be abdominal cramps caused by the presence of the radioactive tube, thus, the smaller the tube used, the less likely is the presence of pain. These symptoms are generally over after the first twenty-four hours, should the radium be left in for a longer period of time. If the radium is introduced shortly after a period, the following menstruation may be missed. On the other hand, if it is applied just before an expected catamenia this may occur as a regular period. Except in one instance, I have not seen more than two menstruations when a sterilizing dose was employed. The high temperature reactions spoken of by some authors have not been met in this series of cases. The highest thermic reaction encountered was 101° F. (38.3° C.) For about two months, rarely more, there is a moderate leucorrhea which is easily controlled by a daily douche. A satisfactory one is obtained by dissolving two teaspoonfuls of "antiseptic powder" (National Formulary) in two quarts of warm water.

When a sufficient dose of radium has been employed the symptoms of the menopause soon follow. These, as a rule, are not more severe than those of the physiologic menopause. To a certain extent, the dosage is influenced by the method of filtration. Thus, if the radium is disposed in steel needles, as ours is, the extra filtration of the steel makes it advisable to use a larger dose than is necessary when the radium is in the form of tubes.

ANESTHESIA

In the series of one hundred and fifty cases reported, local infiltration anesthesia was used fifteen times, spinal anesthesia five times and general anesthesia, in the form of nitrous-oxide-oxygen-ether anesthesia, or, in the presence of hypertension, straight ether anesthesia, one hundred and thirty times. When only a curettage and introduction of radium are performed, local infiltration anesthesia gives such satisfactory results that it is gradually replacing the other two forms in my practice. Its administration is simple and it is the safest procedure to use, especially in women who have lost a great deal of blood. One per cent solution of novocaine is employed. With a long, thin, flexible needle 5 cc. are injected at the base of each broad ligament to block the sympathetic plexuses of Frankenhäuser, 5 cc. are placed anteriorly, at the level of the bladder reflection, and the

same amount posteriorly. After a few minutes the cervix is insensitive and the dilatation may be begun. For spinal anesthesia in these cases I generally use 100 mg. of sterile novocaine crystals. These are dissolved in 2 cc. of spinal fluid and slowly reinjected.

STATISTICS

TABLE II

Fibromyomas — 27 Cases

Ages

36 years	1	46 years	1		
37 "	4	47 "	2		
38 "	1	48 "	2		
39 "	2	49 "	1		
40 "	1	50 "	3		
41 "	2	53 "	1		
42 "	2	57 "	1		
44 "	1	60 "	1		27 Cases
45 "	1				

TABLE III

Radium Dose in Fibromyomas

1800 mg.h.	14	
2400 mg.h.	9	
2500 mg.h.	1	
3200 mg.h.	2	
3475 mg.h.	1	27 Cases

TABLE IV

Additional Operations in the Group of Fibromyomas

Biopsy of Cervix	1
Bilateral Trachelorrhaphy	1
Anterior Colporrhaphy	1
Perineorrhaphy	3
Hemorrhoidectomy	1

In all twenty-seven cases, prior to the radium application, a diagnostic curettage was performed and in each instance histologic examination of the curettings ruled out malignancy. In the case of one woman, thirty-six years old, who had a myoma the size of an orange, about 7.5 cm. in circumference, at the right uterine horn, and who also had a mitral stenosis and regurgitation, a radium dose of 1400 mg. hours was used on December 2, 1926. This completely arrested the bleeding until December, 1927, when it recurred. Examination then revealed a myoma in the same region. A second dose of radium, consisting of 1800 mg. hours, was given, making the total dose 3200 mg. hours. This stopped the bleeding permanently and caused the tumor to disappear. A woman, forty-one years old, who had multiple small fibromyomas, was given a radium dose of 1400 mg. hours and subsequently 1800 mg. hours, making a total dose of 3200 mg. hours. This brought on permanent amenorrhea; but a hysterectomy, with the ablation of the adnexa, was later performed because of pelvic pain. The details of this case follow:

Mrs. ——, Case No. 4947, aged forty-one, consulted me on November 4, 1927. She complained of menorrhagia and metrorrhagia, the periods lasting nine days, with an interval of two weeks. She had been married fourteen years; she had two miscarriages between three and four months of pregnancy and one child at term, delivered instrumentally, who subsequently died.

The physical examination, except for secondary anemia and a few nabothian cysts of the cervix, was negative. A diagnostic curettage was performed on November 9, 1927. The histologic diagnosis was hyperplasia of the uterine mucosa. At this time radium was applied to the uterus, a dose of 1400 mg. hours being given. Following the radium application, on December 13, 1927, she started to flow and flowed freely for five days, after which amenorrhea occurred until August 22, 1928 when the flowing recurred and she began to pass large clots of blood. Drug therapy had no effect on this flowing. On October 13, 1928 a second dose of radium, consisting of 1800 mg. hours, was given, making the total dosage 3200 mg. hours. This brought on a permanent amenorrhea. The blood improved considerably so that it was within normal limits at this time. However, she was complaining of pelvic pain, especially on the left, which could not be relieved by local treatments. Her condition had so improved since her first visit that it was decided to do a hysterectomy in order to relieve her of the pain which she constantly complained of.

On January 7, 1929 a blood transfusion, consisting of 600 cc. of citrated blood, was administered. On January 8, 1929 a supravaginal hysterectomy with coning of the cervix and removal of the adnexa was performed. The convalescence was uneventful. The pathological report was as follows: "Multiple uterine myomas, hyperplasia of the uterine mucosa, chronic cervicitis, localized fibrosis of the uterus, sclerotic ovaries." The fibroids were diffuse in the uterine wall and had not been felt on bimanual examination. The patient was discharged from the hospital, in excellent condition, and has remained well since.

On March 9, 1932 a feeble woman, sixty years old, who had heart disease and who was in no condition to stand an extensive operation, was given a radium dose of 1800 mg. hours for multiple myomas and uterine hemorrhages. The bleeding recurred and on June 29, 1932 she was given a radium dose of 1675 mg. hours. This controlled the hemorrhage, the tumors decreased in size, but, at the last examination on November 4, 1932, they had not completely disappeared.

RESULTS

Twenty-seven women who had fibromyomas were treated. In twenty-four of them the tumors completely disappeared and permanent amenorrhea was established. In two of them the hemorrhage was arrested, the tumors decreased in size but were still apparent at the last examination. In still another, although menstruation had completely stopped, a hysterectomy was performed at a later date because of pelvic pain.

TABLE V

UTERINE HEMORRHAGES OF ADOLESCENCE AND OF YOUNG WOMEN

8 Cases

Ages		*Radium Dose*	
16 years	2	400 mg.h.	1
18 "	1	400 and 500 mg.h.—	
19 "	2	900 mg.h.	1
24 "	3	500 mg.h.	3
	8	600 mg.h.	3
			8

Hemorrhage was arrested and regular periods established in six of these patients. In one of them a second dose of radium had to be given three months later, after which the excessive flowing at the periods ceased. In the case of a young woman, twenty-four years of age, a radium dose of 600 mg. hours had been successful in temporarily arresting the bleeding, but up to the time of her last examination she was flowing more than the normal at the periods. In the case of a single girl, nineteen years old, a 600 mg. hour dose had but little effect on the bleeding and a second dose was advised. This advice was not taken, however, and a hysterectomy was performed by another surgeon.

In all of these cases medical and endocrine treatment had been tried, without results, before resorting to the use of radium.

These patients were treated before the hormones of the anterior pituitary body came into general use. Our present plan of treatment consists of the injection of the luteinizing hormone of the anterior hypophysis, repeated small blood transfusions, the administration of calcium and x-ray exposure over the spleen, giving one-quarter of the erythema skin dose. This régime has proved successful in our recent cases.

UTERINE HEMORRHAGES OF MIDDLE LIFE

104 Cases

For the purpose of this study the hemorrhages occurring between the ages of twenty-nine and fifty-five years have been grouped under the title of—"Hemorrhages of Middle Life." This classification is purely an arbitrary one as there is a difference of opinion as to just what middle life is. The greatest number of women in this group were approaching the menopause or had reached an age beyond which the change of life usually occurs. In this group were included the cases of hypertrophy and hyperplasia of the endometrium and fibrosis uteri.

In all one hundred and four cases a diagnostic curettage was performed.

In the case of a woman fifty years old the following pathological report was received: "Chronic inflammation with hypertrophied endometrium, epithelial cells, atypical. The patient should be watched carefully." A radium dose of 1800 mg. hours was given on February 25, 1928 and she has remained well since. Three women had a dose of 2400 mg. hours; these were border-line cases demanding observation. This has been carried out with satisfactory results. One patient in the series had a hysterectomy at a later date because of recurrent hemorrhages following a radium dose of 1725 mg. hours. The bleeding had been temporarily arrested so that the operation could be safely per-

TABLE VI

UTERINE HEMORRHAGES OF MIDDLE LIFE
HYPERTROPHY AND HYPERPLASIA OF THE ENDOMETRIUM
FIBROSIS UTERI

104 Cases

AGES	
Between 29 and 35 years	9
" 35 " 40 "	18
" 40 " 45 "	35
" 45 " 50 "	33
" 50 " 55 "	9
	104 Cases

TABLE VII

RADIUM DOSE IN UTERINE HEMORRHAGES OF MIDDLE LIFE

500 mg.h.	1
1200 "	14
1250 "	1
1300 "	1
1400 "	3
1450 "	1
1500 "	3
1550 "	1
1600 "	1
1650 "	1
1700 "	2
1725 "	2
1800 "	65
2250 "	1
2400 "	6
4800 "	1
	104 Cases

TABLE VIII

ADDITIONAL OPERATIONS IN GROUP OF UTERINE HEMORRHAGES OF MIDDLE LIFE

Bilateral trachelorrhaphy	8
Amputation of cervix	15
Biopsy of cervix	3
Cervical "polypectomy"	5
Puncture of nabothian cysts	1
Anterior colporrhaphy	3
Colpoperineorrhaphy	22
High vaginal fixation of uterus	1
Kelly operation for relaxed bladder sphincter	1
Reconstruction of right labium minus	1
Hemorrhoidectomy	1
	61 Operations

formed because of her improved general condition. The history of her case follows:

Mrs. ——, Case No. 4304, aged forty, was seen in consultation on March 3, 1927. She complained of flowing daily, although scantily, for a month and a half and of having a stain of blood following coitus. She had been married ten years and had five children, one of whom had been delivered by vaginal cesarean section for eclampsia. On March 5, 1927 a trachelorrhaphy to repair old lacerations had been performed. On March 12, 1928 she had a dilatation and curettage and suture of the anterior lip of the cervix which had again become lacerated following delivery. The pathologic report showed chronic hyperplastic endometritis and polypoid hyperplasia. She was again seen on April 22, 1929; she had severe menorrhagia and secondary anemia, her hemoglobin being 50 per cent. On May 1, 1929 the bleeding had stopped and her condition was somewhat better. Under local anesthesia radium was introduced into the uterus, a dose of 1725 mg. hours being administered. She reported on February 18, 1930 and stated that she had started to flow again in December, 1929. She had then been bleeding for a month and had pain in the region of the left adnexa. She was sent to the hospital and on March 26, 1930 a supravaginal hysterectomy, double salpingo-oöphorectomy and appendectomy were performed. She was discharged well from the hospital. The pathologic report was as follows: "Microscopic examination of sections of the uterus shows atrophic and essentially negative mucosa. The wall of the uterus is essentially negative except for hyalin thickening of the vessel walls, probably the result of involution changes. Sections of the ovary show many old corpus luteum scars and no evidence of active ovulation. Sections of the tubes show atrophy of the epithelium and simplification of the mucosal folds." On May 23, 1930 she reported for examination, at which time it was found that the incision was well healed; the cervix was healed and well suspended and all vaults were clear. She was feeling well and has remained so.

Another patient who had a uterus bicornis unicollis was given a radium dose of 4800 mg. hours. The cervix, which had been deeply lacerated at childbirth, presented all the clinical characteristics of carcinoma. She had had severe uterine hemorrhages for a period of four months and was admitted to the service in a state of severe secondary anemia. On July 8, 1933 a biopsy was taken from the cervix and radium applied. The histologic report on the biopsy specimen was "Chronic endocervicitis with ulceration. No evidence of malignancy." Despite this large dose of radium she continued to bleed. On July 31, 1933 she was given 500 cc. of citrated blood by transfusion, and a panhysterectomy, double salpingo-oöphorectomy and appendectomy were then performed. At operation it was discovered that there was congenital absence of the left kidney and that the right kidney was markedly hypertrophied. She made a good recovery from operation and on October 4, 1933 the examination revealed a well-healed incision; the vaginal vault was healed and well suspended; the patient had gained in strength and was enjoying good health.

On March 17, 1933 a woman, forty-two years old, had an amputation of the cervix for a deep laceration with ectropion and a radium application, consisting of 1800 mg. hours for severe uterine hemorrhages. A pelvic abscess developed and this was drained through the posterior cul-de-sac. Although her convalescence was prolonged, she none the less made a good recovery, the cervix healed satisfactorily, the hemorrhages stopped and she is in good physical condition at the present time. Although a careful ether examination had been made at the time of operation and no sign of pelvic inflammation had been found, there is the possibility that an old infection may have existed.

There were sixty-one additional operations performed on these one hundred and four women. (These are grouped in table VIII.) The healing was not interfered with by the radium application and in all of them the end-results were satisfactory.

TABLE IX

UTERINE HEMORRHAGES AFTER THE MENOPAUSE

11 Cases

Age	Diagnosis	Radium Dose
52	Hypertension. Hyperplasia of endometrium. Previous amputation of cervix.	1200 mg.h.
57	Hyperplasia of endometrium. Cervical polyp.	1800 mg.h.
66	Hyperplasia of endometrium. Cervical polyp.	1800 mg.h.
59	Hyperplasia of endometrium.	1800 mg.h.
63	Hyperplasia of endometrium. Nabothian cysts.	1200 mg.h.
60	Hyperplasia of endometrium. Previous interposition of uterus.	1200 mg.h.
60	Atrophied uterus.	1200 mg.h.
62	Atrophied uterus.	1800 mg.h.
63	Atrophied uterus.	1800 mg.h.
63	Atrophied uterus.	1750 mg.h.
70	Ulceration of vaginal vault. Histologic examination showed no malignancy. Radium pack.	600 mg.h.

In all cases, except in the case of the woman with ulceration of the vaginal vault, a diagnostic curettage was performed and the curettings examined histologically. In the four atrophied uteri, but little endometrium was obtained. However, in these four patients, the radium stopped the bleeding. The cervical polyps were resected and the nabothian cysts fulgurated. The ulcer of the vagina healed and in the six women with hyperplasia of the endometrium the hemorrhage was controlled.

SUMMARY

One hundred and fifty women were treated with radium for uterine hemorrhages of benign

origin. In this series there was no mortality following this form of treatment.

Twenty-seven women with fibromyomata were treated. In twenty-four of them the tumors, which did not exceed a two months' pregnancy in size, completely disappeared. In two of them the hemorrhages were arrested, the tumors decreased in size, but were still apparent at the time of the last examination. In still another, although amenorrhea had been established, a hysterectomy was performed, because of pain, at a later date.

In eight cases of uterine hemorrhages of adolescence and of young women, the bleeding was arrested and regular periods established in six of the patients, although in one of them a second small dose of radium had to be administered. In a young woman, twenty-four years of age, the periods decreased in amount but were still more than the normal at the last examination. A girl of nineteen had been but little helped by a small dose of radium. A second dose was advised but a hysterectomy was performed by another surgeon before this could be carried out. Blood transfusions, calcium, endocrine therapy and x-ray exposures over the spleen control the bleeding in most of these young women, so that radium, which is only used when everything else has failed, is but seldom needed.

In one hundred and four women who had sterilizing doses for uterine hemorrhages associated with hypertrophy and hyperplasia of the endometrium and fibrosis uteri, one hundred and two had permanent amenorrhea and were considered cured. One had a hysterectomy because the bleeding returned after it had ceased for several months. Her condition had so improved at the time of operation that she made an uneventful recovery. One patient, with a uterus bicornis unicollis, had a hysterectomy because hemorrhage persisted after the application of a large dose of radium for what was thought to be a carcinoma of the cervix, but which proved histologically to consist of chronic endocervicitis with ulceration. She had lost and was losing so much blood that it was thought safer to remove the uterus than to wait for the complete effect of the radium. She recovered and is well to-day. In one woman a pelvic abscess developed, the only infection in the entire series. This was drained through the posterior cul-de-sac and recovery ensued.

In the entire group of one hundred and fifty, sixty-eight additional vaginal operations, representing eleven distinct types, were performed. In all cases healing was satisfactory. The eleven women who had hemorrhages after the menopause saw cessation of the bleeding and were permanently improved.

No pregnancies occurred in any of the women in this group after radiation.

CONCLUSIONS

1. Radium, employed in suitable doses, in properly selected cases, is a valuable agent in the treatment of uterine hemorrhages of benign origin.
2. It finds its greatest field of usefulness in women near or at the menopause, having severe hemorrhages from uteri showing no gross macroscopic lesions, as in hypertrophy and hyperplasia of the endometrium and fibrosis uteri.
3. It should be used cautiously, to avoid hysterectomy, in the hemorrhages of adolescence and only after medical, endocrinal and hemostatic treatment have failed. The dose used should be a very small one.
4. It should not be used to regulate the menstrual periods and in an attempt to favor pregnancy, because of the risk incurred by the product of conception.
5. It is of value in treating small fibromyomas of the interstitial type, especially in women nearing the menopause.
6. It may be used in conjunction with operations for the repair of the cervix, cystocele and rectocele, as it does not in any way interfere with the healing.
7. A single application, giving an appropriate dose, is sufficient to bring on permanent amenorrhea.
8. The mortality should be nil or almost nil if the patients are properly selected.
9. These cases may be successfully treated with a small amount of radium (0.050 Gm.) and with a minimum amount of apparatus.

REFERENCE

Phaneuf, Louis E.: Radium therapy in uterine hemorrhages of benign origin. A clinical study of 105 cases. Am. J. Obst. & Gynec. 24: 225, (August) 1932.

DISCUSSION

CHAIRMAN O'CONNOR: The discussion of Dr. Phaneuf's paper will be opened by Dr. Samuel R. Meaker, of Boston.

DR. MEAKER: Progress in gynecology during the past twenty years has been marked by a notable refinement of diagnostic and therapeutic techniques. In particular, the separation of gynecology from general surgery has led to the abandonment of certain crude operative procedures which were in common use a generation ago, in favor of therapeutic methods not only safer but much more efficient. One might list an impressive number of examples. No longer are operations done for harmless retrodisplacements of the uterus. Lacerations of the cervix are treated with the cautery more often than by trachelorrhaphy. The curette has become a diagnostic rather than a therapeutic instrument. In pelvic inflammation, the intelligent use of heat accomplishes far more than does the knife. Endocrinologic treatment is now adequate in certain conditions which formerly were thought to require surgery. And in the same category of therapeutic advances, a conspicuous item is radiotherapy.

This method of treatment is not a panacea. Among the conditions in which it has been tried and found wanting are lesions of the urethra, cervicitis, dysmenorrhea, amenorrhea, sterility, and ovarian tumors. But in properly selected cases, radiotherapy has come to be one of the most valuable therapeutic resources at our command.

I would take issue with Dr. Phaneuf on only one point, and that is the value of radium in postmenopausal bleeding. When this symptom is of benign origin, the pathologic background is commonly atrophy and ulceration, and in my experience the results of the use of radium, which causes a sloughing, have been less uniformly good in such cases than in other types of benign bleeding. I believe that, as a rule, hysterectomy is the better procedure when the tissues are senile.

It is, as Dr. Phaneuf points out, most important to rule out the presence of pelvic inflammatory disease when radium treatment is contemplated; otherwise disastrous complications may follow. In the absence of positive examination findings, a history of chronic vague pelvic pain always warrants suspicion. It is likewise inadvisable to use radium in cases of endometriosis. The tumors may shrink, it is true; but adhesions, which are the chief source of pain, are not relieved.

One can hardly discuss radium without giving some thought to the alternative radiologic method, the use of the x-rays. Their efficiency has become remarkably great; the roentgenologist can now complete all necessary treatment of a small fibromyoma or of a functional bleeding in four short sittings within a single week; and this, of course, without hospitalization or the cost of radium. On the other hand, most patients destined for radiotherapy require in any event hospitalization and anesthesia in order that a diagnostic curettage may be performed; and there is little reason why radium, if indicated, should not be inserted at the same time. In my own practice, the x-rays have their chief utility as a supplementary treatment in those cases already diagnosed with certainty by means of curettage and treated with radium, which have not shown a complete response to the dose of radium used.

CHAIRMAN O'CONNOR: The discussion will be continued further by Dr. Richard Dresser of Boston.

DR. DRESSER: *Mr. Chairman*—Dr. Phaneuf has covered this subject of the radium treatment of benign uterine hemorrhage very thoroughly. He has presented a very large and interesting series of cases, and he is certainly to be congratulated. There is nothing, really, that I can add to his remarks on radium. I should like to say something, however, regarding the x-ray treatment of benign uterine hemorrhage.

As has been stressed already, it is very important that all of these patients have a diagnostic dilatation and curettage. If this is not done routinely an occasional case of cancer is bound to be overlooked. The great argument in favor of radium, it seems to me, is that at the time of this dilatation and curettage it is very simple for the surgeon to insert the radium-bearing capsule and the treatment is over in the course of a few hours. The disadvantage is that a very heavy caustic dose is given to the lining of the uterine cavity when radium is used.

There is still some question as to just the mechanism causing the cessation of bleeding, whether it is this cauterizing effect on the uterine lining, or whether it is the primary effect on the ovaries. Personally, I believe that the effect in causing a cessation of bleeding is due principally to the rays which reach the ovaries.

Now we know, having learned through years of experience in treating benign conditions elsewhere in the body, that it is not safe to give this heavy cauterizing dose of radium, or x-ray for that matter. There are certain untoward sequelae which may develop years after. We do not know they will develop in uterine cases but there is that possibility. We are all familiar with the damage which may occur to the skin from over-irradiation. We all know that most of the early workers with x-ray and radium have died of skin cancer. Just how many of these women are going to develop cancer in years to come as the result of this caustic dose to the uterine lining we do not know. Possibly it will not have the same effect there that it does on the skin, but that is a word of caution.

What is the advantage of x-ray? By using rays produced at high voltages, 200 kilovolts or more, it is possible to deliver a dose to the ovaries of about one-third of a so-called skin erythema which is all that is necessary to stop ovarian function completely. This can be done without the slightest danger to the skin, and without any damage to other normal tissues.

I have some figures that have been gathered by Dr. J. R. Lingley from 87 cases of benign uterine hemorrhage treated at the Massachusetts General Hospital in the ten-year period from 1923 to 1933. Unfortunately, the follow-up notes were complete on forty-seven of these cases, and I have not had an opportunity to complete them further. Of these forty-seven cases, twenty-five were cases of menorrhagia without fibroids, and of this number amenorrhea was produced in nineteen cases, 78 per cent; temporary amenorrhea in five cases; and the bleeding was not satisfactorily controlled in only one case. Those cases in which the amenorrhea was temporary had no bleeding for a period of from one to three years after treatment, and when menstruation recurred it was small in amount and short in duration. These cases were considered by the gynecologists to be good results. Thus, in 96 per cent of this group we obtained very marked benefit from external high voltage x-ray.

In reviewing the fibroids, there were accurate notes in only thirteen as to the size of the tumor both before and after high voltage x-radiation; the fibroids disappeared completely in four cases; in seven cases they decreased definitely in size; and there was no change in size in two cases of very large fibroids.

I may state that the indications for high voltage x-rays are the same as those which have been outlined so well by Dr. Phaneuf in the use of radium in benign uterine hemorrhage.

DR. J. V. MEIGS: I hoped when I came here to speak about prolan therapy that I would have a chance to speak before or just after Dr. Phaneuf, because I think the two subjects are closely associated. I am sure most of us interested in radiology are now using prolan therapy, or at least trying it in those patients between 20 and 40 years of age. I have not used intrauterine radiation recently in the young as the results of prolan therapy are usually satisfactory.

I think Dr. Phaneuf's report is exceedingly good. One hundred and forty-seven cases cured out of 150 is most excellent. Just a word about bleeding after the menopause. In our recent knowledge of ovarian tumors we realize that there is a possibility of granulosal cell tumors causing a recurrence of bleeding in women over the age of fifty. This tumor made up of cells similar to those of the ovarian follicle secretes estrin and produces hyperplasia of the endometrium. In cases with endometrial hyperplasia after the menopause, operation should be the rule. The possibility also of a very small cancer of the endometrium is ever present.

Great emphasis must be placed on the danger of

x-ray treatment given without preliminary diagnostic curettage. At Pondville, in the last month we have had two patients with cancer of the cervix, one dying and one dead who were treated by x-ray for bleeding without diagnostic curettage. I do not believe anyone without real reason should attempt to treat fibroids or any patient with bleeding without careful investigation of the cervix, endometrium and ovaries.

CHAIRMAN O'CONNOR: Is there any further discussion of Dr. Phaneuf's paper?

DR. MCCARTHY: *Mr. Chairman*—May I ask Dr. Phaneuf a question? He said he felt that radium therapy was contraindicated in inflammation of the pelvis. Would the effect be the same with regard to inflammation of other parts of the body? I was thinking particularly of tuberculosis and pulmonary troubles of the chest.

CHAIRMAN O'CONNOR: Is there any other question? Dr. McCarthy asks whether the use of radium in inflammations elsewhere than the pelvis is contraindicated. He has especially in mind the use of radium in tuberculosis. We will ask Dr. Phaneuf to answer.

DR. PHANEUF: I want to thank the gentlemen who were kind enough to discuss my paper and will close in a few minutes as the hour is late. Dr. Meaker and Dr. Meigs have brought up the question of hysterectomy rather than radium therapy for uterine bleeding in women who have passed the menopause. I am in entire accord with them on this subject as I do a hysterectomy on most women. I prefer the vaginal hysterectomy to the abdominal in these older women because of the lack of shock. In the eleven cases reported, when radium was used, the women were poor surgical risks and it was thought that radium would be the better form of treatment. In all of them the bleeding ceased.

Dr. Meigs has spoken of granulosa cell tumors of the ovary resulting in hyperplasia of the endometrium and bleeding in women after the menopause. By doing a vaginal hysterectomy one can examine the ovaries and conserve or remove them as may be necessary. If we go back seventy-five years and use the technique advised by Dr. Joseph Price of Philadelphia, that is removing the uterus vaginally by means of specially constructed clamps which are left on the broad ligaments, we can do a vaginal hysterectomy very quickly. While the average vaginal hysterectomy with sutures takes thirty to forty minutes, an operation done with clamps takes from five to ten minutes. There is very little more shock to this operation than to the application of radium in the uterus. I have now in a hospital a woman, sixty years of age, who had been bleeding freely for the past year and on whom I did this operation. There was no difficulty whatsoever and she is out of bed and well to-day.

Dr. Meaker, Dr. Dresser and Dr. Meigs have emphasized the importance of curettage before x-ray treatment. I believe we all agree on this. In my service at the Carney Hospital this is a rule that all must follow. At the New England Medical Center, which is purely an out-patient department, the old Boston Dispensary, a great many bleeding women are seen, and, as there are no facilities for radium therapy, an excellent x-ray installation permits the giving of x-ray therapy. We insist there that every woman subjected to radiation in any form be curetted first for obvious reasons. Dr. Meigs told you of two cases treated by x-ray who had carcinoma of the endometrium. This emphasizes the necessity of a preliminary curettage to establish the diagnosis before resorting to radiation. X-ray therapy, as presented by Dr. Dresser, is in competition with radium. It does not make very much difference which is used as either should give the same results. In either case, however, a diagnostic curettage, to rule out malignancy, is essential.

As to the results in my cases, I stated that one hundred and forty-seven were cured, but cured was a poor term to use. One hundred and forty-seven cases had cessation of hemorrhage and this was the purpose for which they were treated. I did these one hundred and fifty cases and I have followed them myself. I examine them six weeks after they leave the hospital, three months later, six months later, then once a year after that indefinitely. As a rule I do not discharge these patients but continue to examine them. In line with what Dr. Dresser has said, I do not know what the ultimate result will be. I do know that the bleeding has stopped for the present, but I am unable to say whether or not it will recur at a later date, hence the reason for frequent examinations.

Since my work is entirely limited to the female pelvis and has been limited to that region since I left school, and since I have had no experience with conditions outside of the pelvis, I am extremely sorry that I cannot answer Dr. McCarthy's question in regard to tuberculosis or bleeding from the chest.

CHAIRMAN O'CONNOR: Before adjourning the meeting I take this opportunity to express my most grateful appreciation to the speakers and to those who discussed their papers. I am especially grateful to Dr. Bland, who has come a long distance to talk to us, and to Dr. Miller, who stepped into the breach at the eleventh hour and opened the discussion of Dr. Bland's paper.

The Committee on Nominations has already been in session, and I will ask Dr. Mongan, the Chairman, to make his report.

DR. C. E. MONGAN, Somerville: *Mr. Chairman and Members of the Section*—The Committee on Nominations wishes to submit the following names:

For Chairman, Dr. Thomas Almy, Fall River;
For Secretary, Dr. Charles Kickham, of Boston.

CHAIRMAN O'CONNOR: You have heard the report of the Committee. Are there any further nominations? If not, the Chair will declare the nominations closed. I will entertain a motion that the Secretary cast a ballot containing the names of the nominees. It has been moved and seconded that the Secretary cast one ballot and all those in favor will signify by saying Aye, those opposed, No, and it is a vote.

The meeting was adjourned at 12.15 P.M.

MASSACHUSETTS TUBERCULOSIS LEAGUE

THE PREVENTION AND CONTROL OF TUBERCULOSIS IN THE COMMONWEALTH OF MASSACHUSETTS*

With Special Reference to the Activities of the Massachusetts Tuberculosis League

BY FREDERICK T. LORD, M.D.†

THIS is the twenty-first anniversary of the establishment of the League. There have been no changes in the personnel of its Staff. I am glad to report that the work has been done in a satisfactory and efficient manner.

As in previous years, let me call your attention to the continuing and encouraging decline in the mortality from tuberculosis in the State.

DECLINING MORTALITY

The mortality from the pulmonary form of the disease has steadily fallen during the past 76 years, from 395 per 100,000 living to 53.9 deaths in 1932 and 47.7 in 1933. This decline is largely to be ascribed to improvement in the standards of living and a gradually diminishing amount of community infection. It is fair to assume that the activities of the League have played an important part in diminishing the amount of community infection.

Among the various measures for the prevention and control of the disease, institutional care is of major importance.

TWO BEDS PER DEATH

Generous provision in the Commonwealth for the institutional care of the tuberculous has now increased the number of beds in State, County and other sanatoria to 4,118, or two for each annual death. Long waiting lists in certain institutions indicate that the facilities are not yet adequate for the needs of all communities. It is desirable that Hampden County build a County Sanatorium and there is urgent need for more beds at the Middlesex County Sanatorium. Well-equipped institutions provide expert care otherwise beyond the means of indigent patients.

Collapse therapy by artificial pneumothorax, phrenic nerve operations and thoracoplasty are desirable for selected cases. Pope (personal communication) reports that during 1933 pneumothorax was done on 664 (23.2%) of 2,779 cases, phrenic nerve operations on 216 cases and thoracoplasty on 84 cases. To judge from the report of the Committee on Artificial Pneumothorax of the American Sanatorium Association, the percentage of about thirty per cent of patients treated here compares favorably with that in other institutions in the country. Collapse therapy is now an established and highly successful method of treatment and the tendency is toward its earlier application and in an increasing proportion of cases. Such procedures as phrenic nerve operations, pneumolysis and thoracoplasty require special training and experience and there are difficulties to be overcome in making them readily available to relatively small numbers of patients in widely scattered areas. The proportion of cases in which collapse therapy is used in institutions in the State varies from 0 to 61.6 per cent.

In addition, I should like to call attention to certain matters pertaining to the activities of the League and its Affiliated Organizations.

ACTIVITIES

It is evident that the League and its Affiliated Organizations can best serve the interests of the community by (1) promoting an enlightened public opinion favorable to the adoption of measures for the prevention and control of tuberculosis and (2) by assistance and coöperation in the work of official agencies. With an increase in the number of sanatoria in the State and the desirability of making these institutions the centre of tuberculosis activity in neighboring areas, the problem confronting our voluntary health associations has to a considerable extent changed. There is, in consequence, an added responsibility on the League to help in securing a larger proportion of consents from parents for the investigation of school children and making known the desirability of the examination of all family contacts and the breaking of contacts. In this connection, I would remind you that x-ray facilities are available throughout the State on request by physicians.

STANDARDIZATION

There is considerable variation in the activities of the 28 Affiliated Organizations. The needs of various communities must be met in different ways, but it is desirable that certain standards be formulated to assist in promoting the work in the local communities.

CLINIC FACILITIES

In communities where no plan has yet been formulated to furnish clinic facilities for the investigation of the tuberculous, it is desirable

*Annual Report of the President, of the Massachusetts Tuberculosis League at the Annual Meeting, Boston, April 12, 1934.

†Lord, Frederick T.—Clinical Professor of Medicine, Harvard University Medical School. For record and address of author see "This Week's Issue," page 329.

for the local organization to help to bring about the establishment of such facilities.

TERRITORY SERVED

Fourteen Organizations serve twelve of the fourteen counties of the Commonwealth. One municipal association serves all but a small part of the County of Suffolk. The remaining thirteen Organizations have their headquarters within the territory covered by the County Organizations.

The question may be raised whether it would be desirable in the interest of economy and efficiency to consolidate certain associations. So far as economy is concerned, the consolidation of one or more organizations serving nearby regions would save administrative expenses in curtailing the cost of headquarters and diminishing the amount paid out in salaries. With respect to efficiency, it is to be appreciated that many of the activities of the associations are in personal service in intimate family relationships and that the larger the unit the less intimate the contact with local problems. The decision regarding this question should be decided with due regard to economy, efficiency and the maintenance of familiarity with local needs.

CASE FINDING

The League and its Affiliated Organizations play an important part in formulating public opinion in favor of the investigation of contacts, the breaking of contacts and in coöperation with physicians and Boards of Health in making the investigation possible. Sources of information with respect to undiscovered cases are reported cases, reported deaths and the results of the investigation of school and camp children.

SUMMER HEALTH CAMPS

Of the nineteen Summer Health Camps, in whole or in part maintained by the Affiliated Organizations, six are on the grounds of County Sanatoria. It is desirable to consider whether in the interest of economy and efficiency other Summer Health Camps should not similarly be affiliated with the Sanatoria.

In view of the expense and effort entailed in maintaining the camps, the National Tuberculosis Association has questioned their value. The Summer Health Camps offer an opportunity, by the education annually of about 2,000 children and their subsequent oversight, of creating an enlightened public opinion regarding measures for the prevention and control of tuberculosis. It is desirable to determine if the subsequent history of camp children with respect to arrest of tuberculous infections indicates an advantage of the camps over other available community resources.

Admission to the camps of other than tuberculous children, except for special reasons, is of doubtful value and would seem an unwise expenditure of funds contributed for the prevention and control of tuberculosis. The health of such children can otherwise be promoted by less expensive means. Enrollment in the camps is now largely restricted to children selected on the basis of the standards suggested by the League. Restriction of the advantages of the camps for the most part to those with the milder types of childhood tuberculosis, suspicious cases, contacts reacting to tuberculin and reactors with malnutrition offers the opportunity of preventing further infection in the individual and of controlling the disease in the community.

The findings in the Chadwick Clinics are of interest in this connection and support the policy of more intensive oversight of children in these groups, not only in the camps, but also in the community at large.

RELATION OF TUBERCULOSIS IN CHILDREN TO CONTACT

	Number Reactors		Per Cent Reactors		Number Hilum Cases		Per Cent Hilum		Number Pulmonary Cases		Per Cent Pulmonary	
	Grade	High	Grade	High	Grade	High	Grade	High	Grade	High	Grade	High
Contact	517	196	66%	85%	126	27	16%	12%	2	6	0.1	3.0
Non Contact	10,109	5,407	26%	45%	319	129	0.8	1.	4	7	0.01	0.06

As shown in the table (Pope, Personal Communication: Milbank Conference, March 14 and 15, 1934) the incidence of both hilum and pulmonary tuberculosis is much higher among contact reacting than among non-contact reacting children. The care and oversight of contact reacting children is, therefore, likely to be more profitable from the point of view of preventing the development of tuberculosis than of those without contact. Children with x-ray evidence of hilum tuberculosis deserve special consideration on account of the likelihood of the development of more serious forms of the disease. Thus, Pope finds that reacting children followed as suspects, but without x-ray evidence of infection, develop pulmonary tuberculosis at the rate of 0.15 per cent per year. Those with x-ray evidence of bone tubercles or calcified tracheobronchial lymph glands develop the disease at the rate of 0.3 per cent per year.

In children, the likelihood of the development of the adult type of tuberculosis is two and one-half times greater in females than in males and it is in consequence desirable to consider giving preference to girls over boys in the Summer Health Camps. Children with active or extensive childhood types and those with the adult pulmonary type should, of course, be excluded.

In order that as large a number as possible may benefit by camp life and subsequent oversight, old campers should be rejected except for special reasons. A period of less than two months in the camp may be regarded as undesirable. For the double purpose of protecting the camp children and for its educational value, all candidates for the camps should be Schick-tested and the reactors should be immunized against diphtheria.

The League plans through a special Committee to consider the organization of the camps more fully in the hope of helping you with this aspect of your problem.

CONCLUSIONS

In conclusion, let me say in general regarding the tuberculosis situation that the mortality from the pulmonary form of the disease continues to decline at an encouraging rate. Institutional beds for the care of the tuberculous are still inadequate in certain communities.

Regarding the League and its Affiliated Organizations, it would seem desirable to consider methods of standardization, the provision of clinic facilities in certain regions and with respect to the Summer Health Camps, closer affiliation with the Sanatoria and, so far as possible, closer adherence to certain suggested qualifications for admission.

ANNUAL REPORT OF EXECUTIVE SECRETARY OF THE MASSACHUSETTS TUBERCULOSIS LEAGUE*

BY FRANK KIERNAN†

WE meet to-day in the twenty-second Annual Meeting of the League. By custom, the Executive Secretary presents his annual report of the year's service.

As I stand before you to give this accounting I cannot but say that we meet under a shadow. One of our colleagues who always attended our Annual Meeting and contributed to it by his virile and colorful personality is not here to-day. Tuberculosis work in Massachusetts has lost a champion and we a friend in the passing of Mr. Frederic Edwards of Hampden County. Your Secretary has been asked to speak a eulogy of Mr. Edwards at Springfield later this year. I shall therefore not make any extended remarks at this time save only to place in the record of our Annual Meeting our deep sense of loss of a valuable worker and frank and generous friend.

It is also my sad duty to record the deaths during the year of our beloved Honorary President, Dr. Edward O. Otis, Dr. John H. Lindsey, President of the Fall River Anti-Tuberculosis Society, Dr. Israel J. Clarke, President of the Haverhill Tuberculosis Association, and Dr. J. Holbrook Shaw of the Plymouth County Health Association. All of these men gave most generously of their time and service in the cause of tuberculosis and we gratefully acknowledge our indebtedness to them for their contribution to our work.

One of the outstanding accomplishments of the year and one which your Secretary regards as a classic example of the usefulness of the volunteer organization in this field was the service in connection with tuberculosis in Cambridge.

In May, 1933, we received from Hon. Richard M. Russell, Mayor of Cambridge, a request to make a study of tuberculosis and the facilities for handling it in that City. Our President promptly met the request by calling a special meeting of the Executive Committee at which a representative of the Mayor was present.

It appeared immediately that the task was one for an expert surveyor; one who could evaluate not only the City's tuberculosis work but who could impartially review the work of our Cambridge Tuberculosis and Health Association and render a report that would be a guide to the City authorities and to our Association for some years to come. Accordingly the Committee instructed your Secretary to secure a suitable man to undertake this task. Through the help of Dr. Kendall Emerson, the services of Dr. Carl E. Buck, Field Secretary of the American Public Health Association, were retained for the purpose.

A Sub-Committee of the Executive Committee was appointed to sponsor the study. The Committee met with the Mayor, with members of the Cambridge Board of Health and with Dr. Buck. The Mayor directed the Board and its staff to render every possible service to Dr. Buck in his study of the Municipal Sanatorium and Dispensary. Dr. Buck went to work at once receiving from all the municipal workers prompt and courteous coöperation. He also studied the work of the Cambridge Tuberculosis and Health Association conferring with Dr. Hilbert F. Day, President, and Mrs. Mabel Greeley Smith, Executive Secretary.

Your Secretary and the staff of the League rendered a variety of services to Dr. Buck in his work which was completed and his report submitted to our Sub-Committee on June 8.

*Read at the Annual Meeting of the Massachusetts Tuberculosis League at Boston, April 12, 1934.

†Kiernan, Frank—For record and address of author see "This Week's Issue," page 329.

To this meeting we invited the Chairman of the Cambridge Board of Health who attended and approved the findings and recommendations. Subsequently the Executive Committee of the League approved the report and it was duly transmitted to Mayor Russell.

The major recommendation made by Dr. Buck was that Cambridge should provide modern sanatorium treatment for its patients by arranging for admission to the Middlesex Sanatorium District and that the Municipal Sanatorium of Cambridge should be used for chronic cases. Mayor Russell took the study under advisement for the summer and, shortly after the arrival of our new State Commissioner of Health, a meeting was called by Dr. Chadwick at his office which was attended by the County Commissioners of Middlesex County, Mayor Russell, Dr. Remick, Superintendent of the Middlesex County Sanatorium, and Dr. Hilbert F. Day, President of the Cambridge Tuberculosis and Health Association.

The matter thus became official and is still under discussion with a reasonable expectation that a workable plan can be found for financing the project on which there now appears to be general agreement that it is the best solution of the Cambridge tuberculosis situation. A few days ago our State Commissioner of Health met with the Board of Health of Cambridge and he informs me that the project now has the support of the Board of Health and if a way can be found to finance the transfer it is likely that it will go through.

Another task of considerable significance during the year now closing was a study and report made by the League for the Southern Middlesex Health Association.

This Association, whose President is Dr. Carl C. MacCorison, Superintendent of North Reading State Sanatorium, was desirous of finding out whether the Association was justified in continuing its large Summer Health Camp at Sharon where 143 children are cared for for a period of eight weeks each summer.

In conjunction with the staff of the Southern Middlesex Health Association, the records of 564 children, who could be reached out of the 1,000 who had been cared for in the years 1925 to 1932, were studied, x-rays were taken, and physical examinations given these children at North Reading and Middlesex Sanatoria and tentative conclusions arrived at from a study of the questionnaires, the x-rays and the findings of the examining physicians.

Before the report was presented to the Board of the Southern Middlesex Health Association, it was submitted to Dr. Carl Doering of the Harvard School of Public Health, who commended the Association and the League for the study but who stated that from the standpoint of a statistician it could not be claimed to prove that the children cared for at the Camp would not have been equally benefited if they had remained in the communities where they lived.

At the suggestion of Dr. Doering, the Southern Middlesex Board agreed to a continuation of the study with a view to studying the records of a similar number of children of comparable age and, as nearly as possible, comparable economic and environmental conditions with a view to determining the experience of the second group as compared with the first.

Through the courtesy of Dr. Alton S. Pope, Director of the Division of Tuberculosis, and with the assistance of Dr. Pope's colleague, Dr. Raymond E. Johnson, records of a group of children were selected from the files of the Chadwick Clinics for comparison.

The final report of this Study was presented to the Board of the Southern Middlesex Health Association on March 20 of this year.

The major conclusion of the Committee was that the camp is a worthwhile project, that the immediate benefits to the children are measurable, that the friendly family contacts which the camps provide to the Tuberculosis Associations offer an unusual opportunity for follow-up and health education which could be secured in no other way.

Your Executive Secretary believes that this is an opportune time to say that the constantly recurring question of whether the camps are a legitimate part of the anti-tuberculosis campaign has been answered officially in this Commonwealth. The County Governments through legislation and the appropriations of public funds have in six Counties made the Summer Health Camp a permanent part of the governmental program for the prevention of tuberculosis. Those who doubt the value of the properly conducted Summer Health Camps where children are selected according to the standards promulgated by this League are referred to the County Hospital Trustees and the Superintendents of the County Sanatoria in Barnstable, Plymouth, Bristol, Norfolk, Essex and Hampshire Counties.

The Camp of the Hampden County Tuberculosis Association, located within a short distance from the Westfield State Sanatorium and supplied by the Sanatorium with medical service, is for all practical purposes an adjunct of that Institution.

In Worcester County and in Middlesex County the Trustees of the Sanatoria have in mind the establishment of Summer Health Camps, which under Chapter 354 of the Laws of 1928 are called "Preventoria", and it is my belief that within five years there will be established

at these new institutions, camps similar to those in the other six counties.

Of the remaining seven camps, including Prendergast Preventorium, which are owned and operated by our Affiliated Organizations, the future of these will have to be worked out in each locality according to local conditions.

Preparations for the 1933 Christmas Seal Sale were begun in the summer and the National Association's Director of Seal Sale Service, Mr. Charles L. Newcomb, spent a week in the Commonwealth in September. Conferences were held in Boston for the Eastern Secretaries and in Northampton for the Western Secretaries. Individual conferences were also held with the Seal Sale Committees of local associations requesting them.

Mr. Newcomb and your Executive Secretary made a call of courtesy on Mrs. Calvin Coolidge and later arrangements were made with Mrs. Coolidge in which she formally opened the Nation-wide sale of Christmas Seals in place of President Roosevelt who left Washington to visit Warm Springs, Georgia and was unable to take part in the National opening as had been planned.

We are informed by Mr. Newcomb that the motion picture of the formal opening of the Seal Sale by Mrs. Coolidge, in which your Executive Secretary and students from Smith College and Amherst College participated, was more widely used throughout the motion picture theatres of the United States than any previous picture of its kind. It is of course difficult to evaluate the service which Massachusetts rendered in this manner to the National Seal Sale, but a service was rendered to each State and local tuberculosis association in the Union which we were happy to give our colleagues in this way.

The results of the 1933 Seal Sale were most gratifying especially in view of the early reports in January. We expected a five to ten per cent falling off in the Seal Sale as compared with the previous year but as later reports came in, it was apparent that our local Seal Sale Committees had been conservative in their estimates and that the actual amounts received were in excess of their anticipated final results. We are therefore happy to say at this Annual Meeting that the Seal Sale of 1933 will be only slightly less, if not equal to the sale of 1932 which reached $188,000. This accomplishment in the face of many serious difficulties including the campaigns during December reflects the fine teamwork and careful preparation of all our Affiliated Organizations.

In spite of the defeat by the people at a Referendum in 1932, the chiropractic group in this State again introduced legislation this year which, if enacted into law, would have established the chiropractors in a legal position where they could practice medicine. At the request of the Massachusetts Medical Society, your Executive Secretary again appeared at the hearing opposing the Bill and stating our apprehensions that the gains made in the control and prevention of tuberculosis would be lost if chiropractors were licensed in this State. Your Secretary also filed with the Committee a formal protest stating that our 4,000 members appealed to the Committee on Public Health of the General Court to report unfavorably on the proposed Bill.

We have also gone on record with the Legislature as favoring the Bill now pending to authorize the County Commissioners of Middlesex County to increase the facilities of the Middlesex Sanatorium by the addition of 135 beds.

Due to the death of Dr. I. J. Clarke of Haverhill, the program of the Association in that City ceased to function until we effected a reorganization of the Committee and induced them to secure the services of an Executive Secretary. A successful Seal Sale in Haverhill in spite of local labor troubles and other difficulties enabled the Haverhill Association to take on a Secretary beginning March 1 of this year. Miss Christine B. Higgins, R.N., formerly of Southern Worcester County Health Association, has become Executive Secretary in Haverhill and has energetically set about to inaugurate a constructive program in coöperation with the local Board of Health and school authorities.

We also reorganized during the year the Public Health Committee on Nantucket Island. This Committee has taken on the responsibility for furnishing x-rays to needy persons in the Clinics conducted by Dr. Harry S. Wagner, Superintendent of Barnstable County Sanatorium, who visits the island several times a year.

The Lynn Tuberculosis League was assisted in the annual sale of seals by the League Staff. An increase in the Seal Sale was secured and the Association will take on an Executive Secretary this Spring to inaugurate an educational and preventive program in conjunction with the Health Department and the educational authorities in that City.

We have also begun the reorganization of the Barnstable County Health Association in the sense of augmenting the existing group by representatives from the several towns on the Cape. Your Executive Secretary visited a number of the towns interviewing prospective members and secured the consents of a number of important people who will be brought together to discuss a new program for the Association this summer.

In the fall of 1933 the Executive Committee appointed a Sub-Committee to review the work of the League and report back with recommendations. This report was submitted to the Executive Committee in December with the recommendation that the program of the League as developed during the past nine years be continued without substantial changes. This report was approved and we are proposing to continue our services to the Affiliated Organizations without material alteration.

The question has subsequently been raised as to the programs of the Affiliated Organizations. We have always taken the position that with local Boards of Directors and local Executive Committees of our Affiliated Associations familiar with the conditions in their respective territories the programs carried out represented the best method of meeting the local needs. It seems appropriate, however, from time to time to review the programs of the local Associations and for that purpose detailed reports were asked for and submitted to our President.

At the last meeting of the Executive Committee, a Sub-Committee was appointed to review the work of the local Associations and make recommendations for such changes in their programs as seem desirable in the light of changing conditions. This study will be carried on during the year and as the recommendations for each Association are approved they will be taken up with the Associations and a report on the progress made at the next Annual Meeting of the League.

In the course of the year, your Executive Secretary visited the local organizations, discussed their current programs, organization, finances and Seal Sale. He also attended most of the Annual Meetings and visited most of the Summer Health Camps.

From our Educational Secretary you will hear a report of her Department following the conclusion of this paper. I want at this time to record the notable impression which has been made throughout the country by the "Suggested Teaching Unit for Secondary Schools on Tuberculosis and Its Prevention" prepared by our Educational Secretary and published by the League. This unit is being used not only in the High Schools of our State but through the interest and activity of other State and local tuberculosis associations its use is being promoted in many states and important cities throughout the Union. In twenty states and the District of Columbia the use of this teaching unit is being actively promoted.

The popularity of the unit is no doubt due to the fact that it is based on the new method of teaching which stresses motivation rather than the mere giving of facts. The students who study tuberculosis through means of this unit not only secure the factual data about the disease but are required to consult authoritative books and pamphlets which study brings them into direct contact with the work of the state and local Departments of Health, the National Tuberculosis Association and their state and local tuberculosis organizations. The "Tuberculosis Unit", as we call it, has been commented on favorably by leaders in universities and colleges and also by the Federal Bureau of Education.

The sixth Annual Early Diagnosis Campaign, under the leadership of the National Tuberculosis Association, is being carried on this month. This year's campaign emphasizes the value to communities of their public health services. Your Secretary presented this matter at the Annual Meeting of the Association of Boards of Health and a number of the Boards have secured from us the literature on the campaign for distribution in their communities. A number of our Affiliated Organizations are also carrying on the campaign in their territories.

I would like at this point to cite a few of the current projects of some of our Affiliated Organizations to show the variety of activities which they undertake.

In Holyoke, our Association is leading an aggressive campaign to secure better care of the City's tuberculosis patients through the closing of the Municipal Hospital and the transfer of patients to Rutland State Sanatorium and other suitable sanatoria pending the construction of a county hospital which the county commissioners are now considering at the suggestion of our State Commissioner of Public Health.

In Lowell, Arlington and Haverhill, studies are being made by our Associations of the density of tuberculosis, according to wards in order that the tuberculosis work in those cities may be concentrated where most needed.

In Cambridge, the Tuberculosis and Public Health Association is conducting in conjunction with the local school committee talks on tuberculosis to Parent-Teacher groups in twenty-five school centers.

The Southern Middlesex Health Association has developed in its territory a service to the communities, in conjunction with the State Department of Public Health and the Middlesex County Extension Bureau, by which nutrition meetings for mothers of camp children and others are being held at strategic points at which nutritionists discuss with the groups the economical purchase, the best methods of preparation and the conservation of foods. Similar classes are carried on successfully by our associations in the cities of Lowell and Holyoke.

In Boston the comprehensive program of that association, which includes the Rehabilitation Workshop, Prendergast Preventorium, Employ-

ment Service, Neighborhood Clinics at the headquarters of the Association on Columbus Avenue for Negroes and at the Tyler Street Workshop for Chinese, together with health information service, follow-up of discharged Preventorium children and the Neighborhood Medical Club, presents one of the most well-developed tuberculosis association's programs in the United States. The Boston Association within the year has opened an attractive shop on Newbury Street for the sale of the products of the Rehabilitation Workshop.

The historian of the National Tuberculosis Association quotes one of the Founders of the National Association, as saying in connection with the original meeting at which the campaign against tuberculosis in this country was launched on a nation-wide basis, "There are two conspicuous and equally gratifying features in this National movement. It is thoroughly representative of the leaders of the medical profession and, at the same time, there are ample evidences of a determination to make the Association of direct practical value in legislation, in the education of the public, and in bringing about a coördination of philanthropic, medical and educational agencies for the conquest of this great scourge."

As we take stock at the end of another year of service to the people by the State League and its twenty-eight Affiliated Organizations, it seems fair to state that we are moving forward along practical lines, coöperating completely with the medical profession, doing things of practical value in legislation, in the education of the public, and in bringing about a coördination of philanthropic and educational agencies for the conquest of tuberculosis.

ANNUAL REPORT OF THE EDUCATIONAL SECRETARY OF THE MASSACHUSETTS TUBERCULOSIS LEAGUE*

BY JEAN V. LATIMER†

A FEW years ago there appeared in the bulletin of the Brookline Board of Health the following impressive statement: "Every doctor is convinced of the fact that he often fails to get the satisfactory results from his health measures because of the ignorance of those whose health he is trying to improve. Preventive medicine is, so to speak, marking time, waiting for health education to make possible the application of the advances in science which have been made." The truth of this statement is particularly applicable to Massachusetts where already such rapid official progress has been made in the early diagnosis and treatment of tuberculosis. We now seem handicapped in that a great mass of people are not yet taking full advantage of such opportunities. In order to motivate the action of such groups, we have continued and expanded our efforts through the medium of health education with both adults and children.

Realizing that the control of tuberculosis in the future lies with the youth of to-day, we are working intensively in the high school field. While progress has been made, we have maintained not only our interest, but have given our technical aid for building a more adequate method of health instruction. The unit plan of teaching health, developed by the Educational Secretary of the League, which is based on the premise that pupils become interested in solving specific health problems relating to their own living here and now, has met with a cordial reception by the school authorities. The growing willingness on the part of the secondary schools to discard some of the present subject matter and in its place to substitute more functional knowledge relating to life situations is giving us a unique opportunity for developing a new type of personal health teaching, and for building up an enlightened public opinion in matters pertaining to health. Not only the tuberculosis teaching unit, but other health units ("Elementary Physiology as Related to Healthy Living" and "Community Health") have been revised and mimeographed by the League and placed in the schools of the following cities and towns: Methuen, Saugus, Danvers, Ipswich, Manchester, Swampscott, Beverly, Hamilton, Wenham, Topsfield, Lynnfield Center, South Lynnfield, Middleton, Essex, West Newbury, Newbury, Byfield, Merrimac, Salisbury, Andover, Marblehead, Rockport, Milford, Holden, North Brookfield, Southbridge, Greenfield, New Salem, Orange, Millers Falls, Turners Falls, Sunderland, Whately, Kingston, Bridgewater, Norwell, Hanover, Campello, Brockton, Rockland and Plymouth. We are looking forward this summer to editing and publishing this material. We believe that the development of the units on "Community Health" is to be a contribution, in that through this series we hope to build up with high school pupils the broad significance of public health, thus motivating a development

*Read at the Annual Meeting of the Massachusetts Tuberculosis League in Boston, April 12, 1934.

†Latimer, Jean V.—For record and address of author see "This Week's Issue," page 329.

of a social consciousness in the young people who are to be our future citizens and voters. Such an enlightened public opinion we hope will reflect itself in the local official health agencies of the future. The receptivity of the local school authorities to this material has been in no small measure due to the interest and effort which our local secretaries have spent in developing local confidence.

An intensive, as well as extensive program has been that of the Essex County Health Association, under the supervision of their health education secretary, Miss Kaufer. She has developed a health program in practically every high school in this county. One recognition of her leadership was recently shown in that she was asked to speak on this work at the annual meeting of the Merrimac Valley School Superintendents' Association.

The Southern Middlesex Health Association has also been quite active this year in school health education, in that they have employed a special teacher, Miss Margaret Conoboy, to work under the direction of the League. While the immediate objective was the placing of the tuberculosis teaching unit, there have been even broader influences. As a result of this effort, a high school health education institute will be held in the Winchester High School on May 12th, with Dr. C.-E. A. Winslow of Yale as the main speaker, and with the Executive and Educational Secretaries of the League on the program. From the interest shown, we believe that a representative audience of superintendents, high school principals, teachers and school nurses will be present to discuss and participate in this discussion.

During February the Educational Secretary spent time in the Connecticut Valley doing follow-up work in the high school programs in Hampshire County, and in consultation service with the Holyoke Tuberculosis Association. She also made an official contact with the high schools of Hampden County, with the result that she will return in May to speak before school assemblies, showing the tuberculosis film, and meeting with teachers in round table discussions.

The Educational Secretary has continued to act as Secretary of the State Committee on the Teaching of Physiology and Hygiene in the Secondary Schools. In collaboration with Dr. Diez, Director of the Division of Child Hygiene of the State Department of Public Health, she has prepared a series of units on "Home Nursing and Child Care" for the junior high school, and on "Child Care and Development" for the senior high school girls. She has conferred with consultants of nursing in the State Department of Public Health concerning the experimental use of this material throughout the state. Also, in collaboration with Dr. Diez a nutrition course for the junior high school, as a part of the State Committee's report, has been worked out.

In the elementary field we have continued the service of our library, and have furnished health education exhibit material. In Lowell plans have recently been made for the local association to assist in the development of graded health education activities through which the health objectives of the elementary school may be realized; the Educational Secretary of the League acting as consultant.

Since nearly two-thirds of all the deaths from tuberculosis occur during early adult life, the rate being twice as great for young women as for young men, the League has for some time been concerned with strengthening, and with opening up new avenues of attack on health education with the groups of girls after they have left high school. With the present rapid turnover in industry, and its state of insecurity and unrest, we have not deemed it wise to undertake an industrial program as such. However, we have an opportunity of injecting a health program into the activities and clubs which are already reaching such groups. During the winter, the Educational Secretary has been teaching a health class for working girls in Boston. From their interest she is convinced of the possibilities ahead of us in such lines of work.

We are attempting to interest the Y. W. C. A. and other clubs to include in their programs of sport and recreation more of the health protection and health instructional phases. We are gratified that the Boston branch has taken up this angle of work. Miss Kaufer has been released by the Essex County Health Association to assume a part-time position with the Boston Y. W. C. A. A health week was planned beginning April 23rd, to include a health protection exhibit, with the large electrical sign showing the death-rate from tuberculosis given a conspicuous place; also, posters on the importance of early diagnosis and the real significance of the x-ray. We have also been successful in interesting the Y. W. C. A. staff in informal teaching and health counselling of their girls by means of the unit method.

During March the Educational Secretary conducted a round table discussion for a group of girls at the International Institute of the Lawrence Y. W. C. A. At their invitation she will return for a series of health talks during the coming months. With the shortening of hours in industry, and with the increased leisure time, greater possibilities are ahead of us in the general adult field. That this is needed is obvious, since the medical information which is possessed by such groups is in no small measure built on superstitions and old wives' tales. Also, if

we are to bring about the control of tuberculosis, we shall have to make more use of psychological studies of the factors which motivate human action and base our approach in health education on such; otherwise, our health machinery for early diagnosis will not be widely used.

In this connection parental education as a project connected with the follow-up on summer health camp children, most of whom come from the under-privileged class, is worthy of mention. For four years such a group has been conducted by the Lowell Tuberculosis Association, thus reaching directly into the homes of the children who are contacts and potentially tuberculous. A similar plan is developing this year in Holyoke. Lawrence continues its extensive efforts along this line. Nutrition classes as conducted by the Essex and Southern Middlesex Counties are examples of other types of parental education.

We also need to extend our program of x-raying high school students so that it may become a regular part of the school medical examination.

The Director of Americanization of the State Department of Education has become interested in having the tuberculosis teaching unit adapted for use in their adult classes for the foreign-born. She has asked us to work out such an experimental plan and has suggested certain towns for starting this project.

The Educational Secretary has contacted the state authorities in charge of the C.W.A. educational projects on adult education, for having them include information regarding the cause and prevention of tuberculosis in their programs.

The Educational Secretary has continued as a member of the Child Health Education Committee of the National Association and has been asked to participate in the coming annual meeting in Cincinnati.

In early December she took part in the panel discussion of the Conference on Child Hygiene called by the State Department of Public Health, held at the Hotel Bradford in Boston.

During the summer, consultation field service was given by the Educational Secretary to the summer health camps of the following associations: Berkshire, Northern and Southern Worcester, Hampshire, Southern Middlesex and Norfolk Counties. She spoke to the parents of the camp children in Salem and Hampshire County. Also, she visited the camp in Cambridge and the Essex County camp in Middleton, the Lawrence Tuberculosis League camp and the camp of the Hampden County Tuberculosis Association.

The Educational Secretary of the League has been impressed by the possibilities ahead of the camps for educating the particular group in which we are concerned. All of us recognize whether a child who is potentially tuberculous, develops into an active case is to be in no small measure influenced by the type of personal hygiene which that child will carry on during his entire life, especially up to the period of full maturity. The experience of learning to live by living, as exemplified in an adequate summer health camp, may be one way of instilling into the child the significance of proper health habits.

The fact that for every open case of tuberculosis it has been estimated there are three children who are almost inevitably infected through such contact makes it important that we seek in every way to build up special protective health machinery for such children. Moreover, since most of the children live in an environment where poor housing, improper nutrition, inadequate medical supervision and other circumstances tend to lower resistance to such an extent that the incidence of infection becomes more serious than would otherwise be the case, makes it more important that we seek in some way to compensate the child for such unfortunate surroundings.

The summer health camps offer possibilities for parental education in that parents, when they visit, cannot help but note what proper daily living will do for the improvement of their children. Such opportunities for developing adult education groups have been referred to in a previous paragraph. The challenge is for us to meet this need for continuing parental education throughout the winter months. This is a phase of public health work which in the future must receive more emphasis. It is by educating the child in the schools, in the summer health camps and educating the parents, in connection with the camps, that our efforts will become better coördinated. Extension of the time of stay at camp for each individual child and including groups of older girls are problems ahead of us.

The Health Education Department of the League has given assistance to the Executive Secretary in planning fact-finding surveys on tuberculosis in some of our industrial cities. From these data we hope to obtain factual bases for more intelligent intensive health education in such cities. A community health instruction program needs careful planning and must be based on a knowledge of local problems and opportunities. Also, it is obvious that the continued success in the organization of any tuberculosis program will in the future depend more and more on the degree of coöperation secured with various community agencies, and the extent to which the tuberculosis program is coördinated with these agencies. Assisting in the formation and development of health education councils might well be undertaken by our local organizations. Health education is a broad field in that it relates not only to the individual, but to the community as a group. In order to

bring this about, more social coöperation is needed and more realization that "all are needed by everyone, nothing is good or fair alone."

We like to think of a new deal in health, in which we will substitute health and happiness for wealth as a national ideal, and in which we will translate this new deal into action by health education from babyhood on. The research and demonstration clinics of our own Dr. Chadwick and others have shown how to prevent a large proportion of tuberculosis. It is our responsibility to make this knowledge available to the average person in a form which he can understand and make a part of his living, and to remember that he needs not only to be told but reminded.

ARTHRITIS AS A POSSIBLE MANIFESTATION OF ALLERGY TO INSULIN

BY ALLEN S. JOHNSON, M.D.*

IN the early days of insulin, administration reactions described as anaphylactic frequently followed the injection of the relatively large amounts of insulin which the lack of modern methods of purification and concentration necessitated. In these cases the factor responsible was probably protein contaminant in the extract rather than the small amount of protein in the insulin molecule itself. The reactions were usually in the nature of a mild serum sickness, but most of the reports[1] are vague as to whether the reaction followed the initial insulin injection or a later one. By modern methods of preparation the protein content of insulin has been so reduced that after purification and recrystallization a unit contains only 0.006-0.01 mgm. of nitrogen[2]. Tuft[3], commenting on this fact in 1928, remarked that "This amount of protein is so small that, in the average case, the possibility of inducing hypersensitiveness because of repeated administration is unlikely and reports of such cases are now rare." But Allan and Scherer in a review of Insulin Allergy in 1932[4] stated that there was "an increase in the percentage of cases allergic to insulin even among those not previously treated with insulin". They report cases showing local and general urticaria as evidence of insulin hypersensitiveness which were confirmed by skin tests. They conclude that "General allergic reaction to insulin is manifested by cutaneous, circulatory, and sometimes gastro-intestinal symptoms. Urticarial eruptions and edema are the common cutaneous changes." This is in keeping with the observations of Williams[5], Grimshaw[6], and many others. Tuft[3] reported a case of insulin hypersensitiveness, as a result of repeated injections, manifested by generalized urticaria and edema, which showed by skin test a high degree of sensitivity to purified recrystallized insulin irrespective of its biological source. By the method of local passive transfer of Praussnitz and Kustner reagins to insulin protein could be demonstrated in the patient's serum, these antibodies disappearing four months after the occurrence of the reaction.

In the host of reports which have accumulated in the past ten years, local or generalized urticaria seems to be the outstanding manifestation of insulin allergy. Abdominal pain and cramps, often simulating an acute surgical abdomen, are a less common manifestation[5]. Occasionally there is circulatory derangement with syncope or even shock. In the literature dealing with allergic reactions to modern purified insulin, however, I can find no reports of joint pains such as we commonly see in serum sickness resulting from antitoxin administration. For that reason the following case may be of general interest.

The patient was a thirty-year-old housewife who had been subject to bronchial asthma for the past six years. There was a pronounced family history of allergy; and the patient herself, when skin tested, had reacted to a variety of food, pollen, and epidermal proteins though clinically she had shown no constant sensitivity to any of them. There was considerable evidence to suggest that her asthma was associated with hypersensitiveness to bacterial proteins from her own respiratory tract. The patient's best weight had always been about ten pounds below average for her height and at this time was about thirty pounds below, following a stormy convalescence from a miscarriage. In an attempt to put on weight she was put on a diet of 2250 calories, bed rest, and insulin units X three times a day. Fasting blood sugar was 111 mg. per cent. This fell to 91 mg. per cent twenty-five minutes after ten units of insulin and to 71 mg. per cent one hour and forty minutes after the start of breakfast. The patient had been on this régime for exactly one week and had gained two pounds in weight when she noticed that an urticarial wheal had developed at the site of the insulin injection given twelve hours previously. Coincident with this she began to suffer with mild bronchial asthma and congestion of the turbinates resembling a vasomotor rhinitis. An intradermal test with the insulin which had been used gave a rather equivocal reaction in twenty minutes, but twelve hours later this had become a frankly positive reaction. In this respect it resembled a case reported by Lasersohn[7] in which twelve hours were required for wheal formation. As insulin was not essential it was considered not worth while to try products of different biological origin on a patient whom experience had proved allergic to a great variety of substances. The insulin injections were therefore discontinued, but the asthma and rhinitis persisted for a total of exactly one week. At the

*Johnson, Allen S.—Assistant Visiting Physician, Springfield Hospital. For record and address of author see "This Week's Issue," page 329.

end of that time, exactly two weeks after the start of insulin injections and one week after their discontinuance, the patient began to have severe headache and an afternoon temperature of about 100° F. This continued for four or five days. During the middle of the day, exactly two weeks after the last injection of insulin, the patient noticed stiffness and pain in the interphalangeal joints of both hands. By evening this had spread to the wrists, shoulders, and neck. The joint pain was very severe that night but there was no urticaria. Small doses of aspirin gave very little relief. The next day the involved joints were less painful, but toward evening the symptoms increased in severity and the intervertebral articulations seemed to be involved. On the third day of the arthritis the knees and ankles became involved and the temperature was found to be 101° F. The joint symptoms reached a maximum on the fourth day. Though none of the joints appeared red or swollen at any time, the pain and tenderness were now so severe that the patient could neither walk nor sit up in bed. She volunteered the statement that she thought every joint in her body was involved as any attempt at motion was excruciatingly painful. The temperature remained about 101°. There was no asthma, rhinitis, urticaria, or gastro-intestinal symptoms during this arthritic stage.

The patient took about eighty grains of aspirin during the fourth day with only slight decrease in the severity of her symptoms; but the next day the fever and joint symptoms began to subside without further medication. It is doubtful if the salicylates were of much avail, as the joint pain of serum sickness usually subsides at this time. By the end of the week (i.e., just three weeks after the last insulin injection) all symptoms had disappeared. During the subsequent nine months there has been no joint pain or urticaria though there have been occasional mild attacks of vasomotor rhinitis and bronchial asthma such as the patient frequently had prior to the use of insulin.

REFERENCES

1 Williams, John R.: A clinical study of the effects of insulin in severe diabetes. J. Metab. Research. 2: 729, 1922.
Wilder, Russell M., et al.: Clinical observations on insulin. J. Metab. Research. 2: 701, 1922.
Joslin, Elliott P., et al.: Insulin in hospital and home. J. Metab. Research. 2: 651, 1922.
Geyelin, H. Rawle: The use of insulin in juvenile diabetes. J. Metab. Research. 2: 767, 1922.
2 Abel, J. J., and Geiling, E. M. K.: Researches on insulin. I. Is insulin an unstable sulphur compound? J. Pharmacol. & Exper. Therap. 25: 423, 1925.
Shonle, H. A., and Waldo, J. H.: Some chemical reactions of the substance containing insulin. J. Biochem. 58: 731, 1923-24.
3 Tuft, Louis: Insulin hypersensitiveness: immunologic considerations and case reports. Am. J. M. Sc. 176: 707 (Nov.) 1928.
4 Allan, F. N., and Scherer, L. R.: Insulin allergy. Endocrinology. 16: 417 (July-Aug.) 1932.
5 Williams, John R.: Allergic insulin reactions. J. A. M. A. 94: 1112 (April 12) 1930.
Idem: A second case of gastro-intestinal allergy due to insulin. J. A. M. A. 100: 658 (March 4) 1933.
6 Grimshaw, W. H.: Allergic manifestation to insulin. J. A. M. A. 97: 1885 (Dec. 19) 1931.
7 Lasersohn, Martin: Local insulin reactions. J. A. M. A. 95: 199 (July 13) 1930.

DO PRESENT VITAL STATISTICS MEAN ANYTHING?

Vital Statistics, when applied over a short period of time, are apparently inadequate measures of real health conditions. The lowering of the death rate during this period of depression does not mean that undernourishment and an increase of hazards to tuberculosis will not eventually take its toll! Because of the lowered death rate a misapprehension may root itself, giving the impression that public relief and unemployment are beneficial to good health.

An optimistic feeling at this time is apt to be an anchor from which we may find it hard to loose ourselves, considering the great progress which has been made in the last quarter-century. This progress is immediately noticeable in all of the so-called preventable diseases, including most of the communicable diseases.

A more concerted effort along the lines of prevention is at this time imperative.—*Bulletin of the Buffalo Department of Health.*

MORE AUTOMOBILE DEATHS THIS YEAR

The mortality records of the Metropolitan Life Insurance Company indicate that more people were killed by automobiles during the first quarter of 1934 than in the corresponding months of any previous year. The cumulative death rate for January, February, and March is almost 20 per cent higher than that for last year and 8 per cent higher than in 1931, the previous high year. Unless a radical and prompt improvement takes place, automobile accidents will claim more lives during 1934 than in any previous year.

One out of every five victims of automobile accidents during the early part of this year was a boy, or a girl, under 15 years of age. The marked increase in the number of children killed is perhaps the most discouraging feature of the present picture. Prior to the depression period, there had been virtually no increase in the death rate of children from this cause for 7 years; and for 4 years following 1929 there was a pronounced improvement. So far this year, however, the automobile fatality rate among children is 26 per cent above last year's mark.

Seven out of every 10 of the children killed by automobiles during the first quarter of this year were struck while walking or running in the streets. One out of every 5 children killed was riding on some vehicle other than an automobile or a motorcycle. The death rate from casualties of this type was 57 per cent higher than last year. Most were on sleds or bicycles when the fatal accident occurred.

Among persons 15 years of age and over, deaths from automobile accidents had increased annually up to and including 1931. The death rate dropped a ittle in 1932, and then increased again last year. For the first three months of this year, the death-rate was 18 per cent.—*Metropolitan Life Insurance Company.*

CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

EDITED BY RICHARD C. CABOT, M.D.

CASE 20331

PRESENTATION OF CASE

An unmarried American nurse sixty-three years old entered the hospital complaining of painless jaundice of two and a half weeks' duration.

Two weeks and a half before admission she had a slight cold and cough. At that time she noticed a yellowish color in her face. She had no pain. Early in the course of this illness she noticed eructation of gas after meals. For the first week she had nausea and she induced vomiting for relief about once daily. Everything she ate tasted very bad. Her bowels had been constipated during the past two weeks. The stools were putty colored until the past few days; at that time they became green. Her urine had been of a mahogany color. On the day before admission after eating pie she vomited several times, a brownish vomitus. She developed marked itching of the skin on the day of admission.

Her family history is non-contributory.

She had the usual childhood diseases. She had an attack of appendicitis about twenty years before admission, but was not operated upon. The shock of her sister's death six months before admission forced her to remain in bed for about ten days. During this period she had a mild cystitis. She had had an attack of cystitis two years before admission. She passed the menopause at forty-eight.

Physical examination showed a jaundiced woman with some evidence of loss of weight. Examination of the chest was negative. The blood pressure was 180/90. Abdominal examination showed a questionable resistance in the epigastrium descending with inspiration.

The temperature was 99°, the pulse 82, the respiration 20.

Examination of the urine showed a specific gravity of 1.008 to 1.015. The urine was dark amber colored. There was a slight trace of albumin and a positive bile test. The blood showed a red cell count of 4,100,000, with a hemoglobin of 65 per cent. The white cell count was 8,800, with 85 per cent polymorphonuclears. The stools were negative. A liver function test showed 70 per cent retention. The van den Bergh was 15.6 milligrams. A Hinton test was negative.

X-ray examinations showed no evidence of intrinsic or extrinsic disease of the esophagus, stomach or duodenum. A special examination of the esophagus for varices was negative. There was no evidence of splenic enlargement.

She was given intravenous glucose. The liver was felt in the epigastric region and was not tender. Seven out of seventeen stool examinations showed positive guaiacs. Her jaundice greatly increased. The nausea disappeared and she became slightly stronger. About two weeks after admission the nausea and vomiting returned, continuing and becoming almost constant. She looked emaciated and was losing weight.

A month after admission she was transferred to another hospital, where she showed no improvement. One month later an exploratory laparotomy was performed.

DIFFERENTIAL DIAGNOSIS

DR. RICHARD H. SWEET: After reading the history of the present illness it seems to me we have a pretty good case, so far at least, of obstructive jaundice of some sort. After the statement that the stools were putty colored we are told that they were green. That means that she got bile through. On the other hand she had had painless jaundice of considerable duration, manifested by the fact that she discovered it accidentally; and also that she had had itching of the skin, which to me means that she had had it a considerable length of time. One thing that interested me was the nausea. As I read over the history I was trying to think whether I could say nausea is an outstanding symptom of carcinoma of the pancreas. I know it is of pancreatitis. After thinking it over, however, it does not suggest anything in particular to me unless it might be a disturbance or obstruction of the biliary tract with the backing up of bile.

I am inclined to believe that the past history is of no particular value in helping us. I should like to know if she had ever had an attack of gall stones.

"Abdominal examination showed a questionable resistance in the epigastrium descending with inspiration." That seems like a queer statement. I have never happened to see a patient with questionable resistance descending with inspiration. I wonder if they are referring to the presence or possible presence of a mass in the epigastrium. If it was a mass it might have been her liver; or one might conceive of it as being an enlarged gall bladder. At any rate it is not described, and perhaps we are jumping at conclusions to say that she did have a mass. Someone thought she had something there.

We have confirmation from the laboratory findings as to the fact that she had an obstructive type of jaundice. "The stools were nega-

tive." I suppose that means they were normal in color. That certainly does not fit in with what we expected. If we could assume from the negative statement about the stools that they were clay colored, the laboratory findings would help us to confirm our clinical impression. On the other hand if they were not clay colored and showed bile it would be more difficult to say what she did have. There again we cannot pass any definite opinion.

"X-ray examination showed no evidence of intrinsic or extrinsic disease of the esophagus, stomach or duodenum." I should say that is a very important statement, because if she had carcinoma of the pancreas and later developed vomiting it is of interest to know if she had anything wrong with her stomach. One of the common complications of carcinoma of the pancreas is a malignant obstruction in the duodenum from direct invasion by the growth.

I wonder why they examined the esophagus for varices. We have not heard anything about bleeding, unless the dark brown vomitus was due to blood.

"The liver was felt in the epigastric region and was not tender." That makes me wonder if the descending resistance which was noticed before was her liver.

It seems to me, taking it all in all and overlooking one or two things which we perhaps should consider, such as the negative statement about her stools, that the most likely possibility here is obstructive jaundice of some type. She has apparently an enlarged liver, which might go with that. She might also have as an explanation of her enlarged liver a carcinoma. The thought occurs to me though that it takes a tremendous amount of carcinoma of the liver to make any clinical jaundice. I should prefer therefore to think she had some obstruction of the common duct or of the biliary system. It is of some importance for us to know, I think, whether she had a palpable gall bladder in deciding where the obstruction is, if we assume that she has an obstruction. If we can believe, as might be assumed from this record, that she did not have an obstructed gall bladder, it might be carcinoma of the biliary ducts above the cystic ducts. On the other hand the resistance might be liver and also a palpable gall bladder. In that case the most common thing would be obstruction of the duct below the junction of the common and cystic ducts. The most common cause of that is carcinoma of the head of the pancreas.

We also hear of silent gall stones, that is, stones in the common duct. I do not see how one can make a diagnosis of that in this case without some history of gall stones in the past. We can pass it with a mere mention.

I should say the probability is that this was a case of obstructive jaundice, and if the mass that was felt was gall bladder one would assume that it was due to carcinoma of the pancreas. If on the other hand she did not have a palpable gall bladder, we might guess that the obstruction was somewhere else, probably in the hepatic duct above the cystic duct.

Clinical Discussion

Dr. Walter S. Burrage: I will try to answer a few of Dr. Sweet's questions that were not brought out in the history. When she was seen outside the hospital, the story about her sister's illness and death sounded as though it might be of importance in that she had started to lose weight and had considered that she had done so due to the worry on that occasion. In the past three months, she had gradually lost sixteen pounds without any evidence of digestive trouble, except an increase of gas and some minor indigestion.

The onset of her jaundice was sudden, and up to the time she entered the hospital, two weeks after she was first seen, the jaundice had been pretty persistent.

As to the question of the stools, they were clay colored or normal in color. On some occasions they were definitely clay colored and on others some bile came through. During the period of a month when she was in the other hospital she lost eight pounds in weight in spite of everything that could be done by intravenous glucose and other treatment. She did not lose weight entirely because she did not eat properly, for during that period she was not vomiting and was taking food regularly.

In connection with her physical examination, she did have a palpable liver coming down about three fingerbreadths, but no gall bladder that we could feel. This was confirmed by Dr. Chester Jones and by Dr. Randall Clifford. The guaiac on her stools was positive on about eight occasions and negative on the others. There was no gross blood at any time. Aside from a mild anemia there was nothing in the blood. The white cell count was normal throughout. The temperature averaged 99°, and never went over 99.8°.

She was seen by Dr. Chester M. Jones on various occasions and the diagnosis of catarrhal jaundice was considered. The possibility of a malignancy came up, an open-and-shut type of affair letting the bile through.

When she was transferred to the other hospital she was in the same condition as when she entered the Massachusetts General. She was seen by Dr. Richard Miller and exploration was considered. Her condition remained practically the same, although she lost a few pounds and was going downhill. The jaundice was intense from start to finish, with no remission.

The operation was an exploration. Dr. Miller said that he could see a small malignant growth about the size of the end of a thumb at the junction of the common and hepatic ducts.

It was in such a place that he felt it could not be removed. He made the statement, "We were licked before we started," and closed the wound.

DR. TRACY B. MALLORY: Have you anything to add, Dr. Jones?

DR. CHESTER M. JONES: The thing that interests me in this case is that there are a certain number of older people who present a picture of painless jaundice just like this when it is impossible to make an accurate diagnosis. A certain number of them are passed up as inoperable cancer of one type or another; or it is suggested that there is a condition that should be operated on, and at operation we find some type of infectious disease in the liver, but no extrahepatic disease.

We talked this case over a good many times and my impression was that even if it were fairly likely that the patient had malignancy, the chances of helping things by surgery were zero. We felt that the only thing to do was to treat her as if she had infectious jaundice, and that there might be some hope for improvement as we went along.

It was interesting that she did have intermittent return of bile in the stools. Some stools had an appreciable amount of bile so that they were a good golden yellow. The fact that nearly every other stool gave a positive guaiac interested me. My impression is that one can get a one or two plus guaiac in any case with prolonged jaundice. It does not mean malignancy, although it frequently does occur in the presence of malignant lesions. I think it is one of the findings that do not help. It is true one finds it and does not know how to interpret it. It brings up the same question that has been mentioned here before, namely, the absence of splenic enlargement. I think the fact that she had no palpable spleen in the face of prolonged jaundice was against intrahepatic disease and in favor of malignancy or stone.

What Dr. Sweet said about silent stone I would agree with. There is occasionally a silent stone, but it is very rare that you get it in the sense that there are no symptoms. I think a painless stone nearly always has mild digestive disturbances over a period of time. An absolutely silent stone with no symptoms is rare, and I think her completely negative history is against the possibility of stone in the common duct.

I more or less opposed surgery in this case and I am inclined to think that I would again, because as a rule if one watches a case for a reasonable length of time one can make a determination as to what might be expected from surgery. I think if she was to be operated on she should have been operated on sooner. I may have been responsible in this case, but I doubt if anything could have been done. Even if she had been operated on earlier I doubt if the growth could have been removed.

CLINICAL DIAGNOSIS

Malignancy of the common duct.

ANATOMIC DIAGNOSES

Carcinoma of the hepatic duct at its bifurcation.
Metastases to regional lymph nodes.
Icterus.
Operative wound, laparotomy.

PATHOLOGIC DISCUSSION

DR. MALLORY: We disagreed very slightly with Dr. Miller as to the location of the tumor. He said he thought it was at the entrance of the cystic duct into the common duct. We found it at the junction of the hepatic ducts, which was exceptionally high in this case, practically in the liver, and the upper part of the nodule invaded the liver very slightly. The cystic duct opened into the common duct half a centimeter or so below the nodule. The location of the mass so high up in the biliary tract would have made any sort of anastomosis impossible in this case no matter how small the tumor was when it was first discovered, because one could not have got hold of the two hepatic ducts and sewed them to anything.

DR. BURRAGE: I forgot to say that Dr. Miller said the gall bladder was absolutely collapsed; one of the few situations of the sort he had seen at operation.

DR. SWEET: Would not the fact that the gall bladder was collapsed prove that there was no obstruction in the cystic duct? If it were at the junction of the common and cystic ducts we ought to have conditions similar to that of stone impacted in the cystic duct and dilatation of the gall bladder. That observation I should think would help to localize it.

I should like to ask Dr. Jones a question about the infection. The temperature was 99°. What is your experience with fever in cases of jaundice of this sort with infection?

DR. JONES: I can remember offhand half a dozen cases of older persons who have had a jaundice that subsequently healed. They did not have a typical onset such as catarrhal jaundice, but must have had some type of infectious process in the liver. In almost all these cases there was very little elevation of temperature. Whether it is purely an infectious process or not is questionable, but there are just enough of them so that one does not have to be absolutely pessimistic about this group. They get complete recovery even after jaundice which lasts for three or four months. I can recall one patient of sixty-five who was operated on in May. He came down here after being jaundiced for three months. At operation nothing was found. He has done well for eight

years. One is always justified in considering the possibility of an infectious process.

A SURGEON: In regard to the blood in the stools, I should like to ask Dr. Jones if there is any relation between that and increased clotting time in infectious jaundice.

DR. JONES: I think we usually get some prolongation of clotting time in this group that has much bleeding in the stools, or we get an increased sedimentation rate. I may be wrong, but my impression is that we get it in any prolonged jaundice case regardless of the cause.

DR. MALLORY: I should agree to that.

DR. BURRAGE: In closing and confirming Dr. Jones's statement, I think everyone felt this was probably malignancy, but due to her condition exploration with that history of jaundice would be a very serious affair, and we thought it best to treat it on the other basis.

CASE 20332

PRESENTATION OF CASE

The patient was a sixteen months old boy who was referred to the hospital because of drowsiness and stiffness of the neck.

All other members of the family were well at the time the patient was admitted.

The birth was at term, the delivery normal. The baby was in good condition, had no snuffles, cyanosis or convulsions. He was breast fed for nine months. Cod liver oil and orange juice were given at six weeks. His development was normal. He began to walk at nine months. At this time he contracted pertussis from his only sibling, a sister of six years who was attending school. He was very ill, but at thirteen months was quite well. He learned to walk again. He had been well since that time.

Three days before admission the parents thought he seemed drowsy. The next day he began to cough. (There had been no cough for six weeks). A physician was called. He noted that the child had a fever (102°) and that the chest was clear. The child continued to be very drowsy, but did not vomit or have a diarrhea; he had no pain and no ear or urinary symptoms. The night of admission the physician found the neck to be stiff and advised hospitalization.

Physical examination showed a well developed and nourished, acutely ill boy who was breathing shallowly and with a grunt. His eyelids seemed to be heavy. The eardrums showed normal landmarks. The alae nasi were dilating. The throat was injected. The neck was moderately stiff. There were dullness, bronchial breathing and râles at the apex of the right lung and over the entire left chest anteriorly. The heart was normal in size. The liver was palpable three fingerbreadths below the costal margin. The knee and ankle jerks were not obtained; otherwise the reflexes were normal.

The temperature was 101.6°, the pulse 140, the respirations were 40.

Laboratory. The white blood cell count was 4,100. The differential count was 60 per cent polymorphonuclears, 40 per cent lymphocytes. The hemoglobin was 60 per cent (Tallqvist). The spinal fluid withdrawn by a lumbar puncture was normal.

Course. The morning after admission the lung signs were more marked, the right upper and left lower lobes being involved. The color was somewhat dusky. The neck was no longer stiff. The patient was put in an oxygen tent. His condition became gradually worse. The temperature rose to 105.6°, the pulse rose from 160 to 184 and the respirations were about 56 per minute. The child died thirty-two hours after admission.

CLINICAL DISCUSSION

DR. HAROLD L. HIGGINS: The story as given clearly points to the child having pneumonia. In looking over his past history we learn that he had pertussis when he was nine months old; he was very sick and probably had pneumonia at that time. A child who has had pneumonia once seems very prone to get it a second time.

We find that the family physician saw the child. The symptoms that stood out at that time were drowsiness, a little cough, fever, and a stiff neck. Apparently the physician did not find anything abnormal in the child's chest. A pneumonia with signs hidden for some time on physical examination is usually behind the scapula. It is in the upper part of the lower lobes or the lower part of the upper lobes. The final localization of the pneumonia here makes me feel that the disease perhaps was not present on the day before he came to the hospital. The white cell count of 4,100 and the pneumonia appearing several days after the onset of the illness suggest strongly that the case is one of what we might call influenza and that there was a secondary pneumonia which probably was pretty general and became localized in several lobes. I should think that the most likely diagnosis would be influenza with a secondary pneumonia.

I think the outstanding symptoms of pneumonia are based on anoxemia or toxemia. Some pneumonia patients show a predominance of toxemia, some of anoxemia. We may gather that in the last day of the pneumonia that the child was suffering from anoxemia. His lungs were extensively involved and this prevented oxygen getting from his lungs to his blood. I feel that death probably was due to insufficient oxygenization of his blood. The enlarged liver and the drowsiness indicate toxemia as well as anoxemia in this patient.

A prominent symptom in this child was a stiff neck. Pneumonia patients are very prone

to have a stiff neck due to meningismus. I personally rest very much easier in these cases if I am sure there is no meningitis. I also think that relieving the spinal fluid pressure makes the patient more comfortable. I am inclined to do a lumbar puncture if it can be done readily. I think it makes the patient feel better and I have not seen it do any harm.

DR. TRACY B. MALLORY: Are there any questions?

A PHYSICIAN: How about the white cell count?

DR. HIGGINS: The leukopenia suggested influenza, very similar to what we saw in the war. The marked diffuse pneumonia—it was not limited to one lobe, but was widespread—made me feel that it was secondary to the influenza. We do get a low white cell count sometimes in other types of pneumonia, even in primary lobar pneumonia. I think the chances were against this child's having lobar pneumonia. A low white cell count in pneumonia does make the prognosis more serious.

CLINICAL DIAGNOSES

Influenza.
Bronchopneumonia.

ANATOMIC DIAGNOSES

Bronchopneumonia, bilateral.
Pleuritis, acute fibrinous, right.
Hydrothorax, bilateral.
Endocarditis, slight terminal, mitral.

PATHOLOGIC DISCUSSION

DR. MALLORY: The autopsy here showed widespread pneumonic foci which were evidently of somewhat varying age, the process in the upper lobes appearing in general older than the lesions in the lower lobes; although finally portions of every lobe had been involved.

Microscopically the picture is very atypical for a pneumonia in that the infiltration in the alveoli is very largely of mononuclear rather than of polynuclear cells. That agrees in general with his relatively low white cell count and the relatively low polymorphonuclears in the differential count. In several places there was beginning abscess formation; where half a dozen alveoli were found to have fused into minute cavities.

There was also a terminal acute endocarditis on the mitral valve, probably due to the same organisms or at least to one of the organisms causing the pneumonia in the lungs. An acute endocarditis is always a possibility in pneumococcus infections, although in general one sees it in the more chronic cases. The only organism grown from this case was a pneumococcus which was finally typed as one of the subtypes of what we used to call type IV.

DR. HIGGINS: Do you think this would fall into the influenza group we saw during the war?

DR. MALLORY: I do not believe I can say that it does or that it does not. It is distinctly an atypical pneumonia which I find very difficult to classify.

DR. HIGGINS: Was there any fibrin?

DR. MALLORY: Very small amounts, but in general fibrin was very scant. The rather marked tendency to abscess formation in a pneumonia of only five days' duration is quite unusual. When a pneumonia has run twelve or fifteen days one begins to find abscess formation not infrequently. It is uncommon to find it in cases of such short duration except in the inspiration pneumonias of the postoperative state.

A PHYSICIAN: How was the tracheal lining?

DR. MALLORY: It was moderately congested, —no more so than the average case of pneumonia.

The New England
Journal of Medicine

SUCCESSOR TO

THE BOSTON MEDICAL AND SURGICAL JOURNAL

Established in 1828

Published by THE MASSACHUSETTS MEDICAL SOCIETY under the jurisdiction of the

COMMITTEE ON PUBLICATIONS

R. I. Lee, M.D., *Chairman* HOMER GAGE, M.D.
R. B. OSGOOD, M.D. R. M. SMITH, M.D.
F. H. LAHEY, M.D.

EDITORIAL STAFF

REID HUNT, M.D. STEPHEN RUSHMORE, M.D.
JOHN P. SUTHERLAND, M.D. HANS ZINSSER, M.D.
GEORGE R. MINOT, M.D. BENJAMIN WHITE, PH.D.
FRANK H. LAHEY, M.D. HENRY R. VIETS, M.D.
SHIELDS WARREN, M.D. ROBERT N. NYE, M.D.
GEORGE L. TOBEY, JR., M.D. ROBERT M. GREEN, M.D.
C. GUY LANE, M.D. CHARLES C. LUND, M.D.
WILLIAM A. ROGERS, M.D.
WALTER P. BOWERS, M.D., *Managing Editor*

ASSOCIATE EDITORS

GEORGE G. SMITH, M.D. WILLIAM B. BREED, M.D.
JOSEPH GARLAND, M.D.

THE NEW HAMPSHIRE MEDICAL SOCIETY
PUBLICATION COMMITTEE

CARLETON R. METCALF HENRY H. AMSDEN
WARREN H. BUTTERFIELD

THE VERMONT STATE MEDICAL SOCIETY
PUBLICATION COMMITTEE

WILLIAM G. RICKER, M.D. C. F. DALTON, M.D.
E. A. STANLEY, M.D.

SUBSCRIPTION TERMS: *$6.00 per year in advance, postage paid for the United States, Canada $7.04 per year, $8.52 per year for all foreign countries belonging to the Postal Union.*

Material for early publication should be received not later than noon on Saturday. Orders for reprints must be sent to the Journal office, 8 The Fenway.

The Journal does not hold itself responsible for statements made by any contributor.

Communications should be addressed to The New England Journal of Medicine, 8 The Fenway, Boston, Mass.

DOMICILIARY MEDICAL CARE FOR THE INDIGENT

DOMICILIARY medical care for the indigent in Boston has been given formally by private organizations for many years, and informally by physicians not organized for the purpose for a still longer time. The work was arranged long ago on a geographical basis and at one time service on the "District" seems to have been part of the ritual in the training of young physicians. "You will observe," said a well-known teacher in the Nineties, "that all the successful physicians in Boston began practice with work on the district." The auditor failed to note whether the speaker's tongue was or was not in his cheek. But so valuable was this experience held to be by young physicians that appointments were sought eagerly.

Recently in medical education, emphasis has been laid on the importance of seeing patients in their homes, and various forms of apprenticeship have been devised in an experimental mood. Tentative conclusions are that the scheme is worth while and should be developed.

While the educational significance, for the medical students or young physicians, of the domiciliary care of patients has been recognized and is receiving more attention, some other aspects of this work present troublesome recurrent problems. Recently the private organizations in Boston have found it increasingly difficult to carry the rapidly increasing financial load. Is it not time to have a thorough study made of the basis of curative and palliative medical service by the city? The municipal hospital through its wards and out-patient department cares for two groups of patients, those who need bed care in the hospital and the ambulatory cases. Why should the city hospital not assume responsibility for patients confined to their homes?

The logic of theory is clear: it should assume such responsibility. The logic of fact is that many persons, some of them well qualified to know, claim that great abuse of the medical services given by the city has developed: with extension of service will come extension of abuse in all probability. But it is also a fact that such abuse will persist and will extend only if the persons in responsible positions are willing to have it do so.

Assuming, however, that the abuse is in large part if not wholly preventable, the difficulties in the way of having the municipality take over the domiciliary medical care of the indigent seem to be not insuperable. In any case it would be desirable to make a study of this whole situation to see if some more nearly satisfactory plan can be devised. Among the persons making such a study there should be a physician, a nurse, a hospital administrator, a teacher of medicine: for there are involved the medical care of the patient; the nursing care of the patient; the fitting of the scheme into a hospital organization with interns and staff; and the important educational side of the scheme as it affects both interns and undergraduate students. Other interests also are implicated and should be represented.

It is to be hoped that such a study can be made so that Boston may have the benefit of the experience (for good or ill) of other municipalities in their attempts to solve similar problems. As some of the private organizations have been recipients of assistance from the Community Campaign Committee, perhaps a study of this situation could be included in the more comprehensive study for which plans have already been made by that body in accordance with the recommendation of the Chairman.

VITAMIN A AND COLDS

NEW uses are constantly being found for the vitamins. For some time past vitamin A, a definite deficiency in which results in keratomalacia

and xerophthalmia, has been heralded as a possible preventive of acute upper respiratory infections, when it is ingested either in its vitamin form or as carotene, the yellow pigment found in many foods. Esther L. Gardner and Floyd W. Gardner set themselves to prove or disprove this contention and conducted experiments to determine whether supplementing the diet of school children with haliver oil or definitely enhancing it with vitamin A as found in foods would decrease the incidence and severity of colds. (*Am. J. Dis. Child.*, 47:1262 [June] 1934.)

Two groups of twenty-five children each were consequently selected, the children ranging from six to fourteen years of age and paired as nearly as possible as to age, sex, nutrition and susceptibility to colds. Group I was given sufficient haliver oil to supply at least 8,500 units of vitamin A; Group II was placed on a diet so selected as to incorporate the foods that would supply an abundance of vitamin A, the standard daily requirement being placed at 10,000 units. A control group of twenty-five children was also selected, although this group showed a much higher resistance to colds than did the other two groups. The experiment continued for twelve weeks beginning November 20.

According to the results, haliver oil or a balanced diet including an abundance of foods containing vitamin A plays a definite rôle in decreasing the incidence and severity of colds among school children, and this increased resistance is accompanied by a higher degree of general health, as is shown by an increase in weight. It was found also to be necessary, however, that the diet should not be lacking in vitamin C.

Sherman and Cammach are quoted as having produced evidence that vitamin A is stored in large quantities in the body, and that the maximum quantity which the body is capable of storing is reached by gradual accumulation.

ANOTHER DIAGNOSTIC METHOD FOR CANCER?

HARDLY a scientific meeting goes by but bears evidence of the widespread interest in the cancer problem and the many angles from which it is being attacked. At times contributions of definite value are made, at other times nebulous hypotheses are put forward with but scant evidence to back them. Many of these latter are picked up in the daily press and gain some degree of credence among the laity.

According to recent newspaper dispatches interest has been aroused in spectroscopic examination of the blood in order to reveal early cancer. As yet no account of this method has appeared in medical literature.

The numerous tests for the diagnosis of early cancer by examination of the patient's blood in various ways have all had their moments of popularity and attention and then lapsed into near oblivion. Many will remember the recently acclaimed and soon discredited Bendien test. The Abderhalden test, the Roffo test, and others have had their day.

The press dispatches do not state just what substances in the blood give the differences between cancerous and non-cancerous blood spectroscopically. It would be well to reserve judgment on this new test until full details are available and to remember that the oft-chased rainbow of hope has not yet led to the pot of gold in cancer diagnosis.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

MEIGS, JOE VINCENT. A.B., M.D. Harvard University Medical School 1919. F.A.C.S. Surgeon to Out-Patients, Massachusetts General Hospital. Associate Surgeon, Collis P. Huntington Memorial Hospital. Surgeon, Pondville Hospital, Norfolk. Assistant Surgeon, Palmer Memorial Hospital. His subject is "Prolan in the Treatment of Abnormal Uterine Bleeding." Page 289. Address: 264 Beacon Street, Boston, Massachusetts.

BLAND, P. BROOKE. M.D. Jefferson Medical College of Philadelphia 1901. F.A.C.S. Chief of the Department of Obstetrics, Jefferson Medical College Hospital. Professor of Obstetrics, Jefferson Medical College of Philadelphia. His subject is "Fetal Birth Injuries with Special Reference to Intracranial Lesions." Page 296. Address: 1621 Spruce Street, Philadelphia, Pennsylvania.

PHANEUF, LOUIS E. Phm.D., Ph.C., Sc.D. (Hon.) M.D. Tufts College Medical School 1913. F.A.C.S. Professor of Gynecology, Tufts College Medical School. Gynecologist and Obstetrician-in-Chief, Carney Hospital and Malden Hospital. Surgeon, Department of Gynecology, New England Medical Center. Consulting Gynecologist, Beth Israel Hospital. His subject is "Radium Therapy in Uterine Hemorrhages of Benign Origin." Page 304. Address: 270 Commonwealth Avenue, Boston, Massachusetts.

LORD, FREDERICK T. A.B., M.D. Harvard University Medical School 1900. Visiting Physician, Massachusetts General Hospital. President, Massachusetts Tuberculosis League. Clinical Professor of Medicine, Harvard University Medical School. His subject is "The Prevention and Control of Tuberculosis in the Common-

wealth of Massachusetts with Special Reference to the Activities of the Massachusetts Tuberculosis League." Page 312. Address: 305 Beacon Street, Boston, Massachusetts.

KIERNAN, FRANK. A.B. Executive Secretary, Massachusetts Tuberculosis League. His subject is "Annual Report of Executive Secretary of the Massachusetts Tuberculosis League." Page 314. Address: Massachusetts Tuberculosis League, 80 Boylston Street, Boston, Massachusetts.

LATIMER, JEAN V. B.S., M.A. Educational Secretary, Massachusetts Tuberculosis League. Her subject is "Annual Report of the Educational Secretary of the Massachusetts Tuberculosis League." Page 318. Address: Massachusetts Tuberculosis League, 80 Boylston Street, Boston, Massachusetts.

JOHNSON, ALLEN S. A.B., B.A., M.D. Harvard University Medical School 1927. Assistant Visiting Physician, Springfield Hospital. Visiting Physician, Tuberculosis Division of the Springfield Isolation Hospital. His subject is "Arthritis as a Possible Manifestation of Allergy to Insulin." Page 321. Address: 121 Chestnut Street, Springfield, Massachusetts.

MISCELLANY

VETERINARY HELP IN MAN'S PROBLEMS

EXCERPTS FROM THE ADDRESS BY DR. JOHN R. MOHLER DELIVERED AUGUST 14

Veterinary science and medical science overlap in several important fields. In others medicine has advanced on the basis of discoveries made by veterinarians. The two professions coöperate in protecting public health. Veterinary supervision of animals at the time of slaughter is the basis for the branch of the pharmaceutical industry which utilizes glands and other parts of animals in providing treatments for human ailments. These were some of the points developed by Dr. Mohler of the U. S. Department of Agriculture in discussing the relationship of veterinary science to animal breeding and public health, at the general session of the Twelfth International Veterinary Congress in New York City.

In studying and encouraging the breeding of better domestic animals the veterinarians have benefited farmers and consumers, and have also benefited themselves. On the average, pure-bred animals have a utility value at least a third greater than ordinary livestock, and this margin of value encourages the employment of scientific aid in case of disease. Economically, farmers are benefited greatly by the coöperation of veterinarians and food and drug officials in keeping off the market quantities of worthless nostrums advertised to cure the ills of livestock and poultry.

"The relationship between medical and veterinary science is especially illustrated in the field of treatment for maladies that affect the health of both human beings and the lower animals." He mentioned as examples, anthrax, rabies, tuberculosis, milk sickness and parasitic infestations. There are others less common in which the form of the human disease closely resembles that of a corresponding animal malady though the exact relationship may not yet be fully understood, and in which the two professions have joint interest.

As examples of the way in which veterinary science has sometimes led the way to advances in medical science, he cited the veterinary research into tick fever which established the fact that insects may carry diseases. "This discovery was the basis for controlling malaria, yellow fever, typhus, bubonic plague, and many other human diseases carried by insects."

A scientist working with the causal agent of infectious abortion of cattle discovered that it was intimately related to the organism causing undulant fever of man. The close relationship of veterinary research to public health research was emphasized by the transfer of the work and of the scientist doing the work to the Public Health Service.

Meat inspection is an achievement of veterinary science, which protects public health and is regarded virtually as a public utility, according to the speaker. In protecting the milk supply the medical profession exercises sanitary control of the fluid, but the veterinarians test for tuberculosis and other infections.

Veterinary supervision of animals at the time of slaughter, which is a part of the meat inspection service, is also, according to Dr. Mohler, the basis for a branch of the pharmaceutical industry which uses glands and other parts of slaughtered animals to prepare treatments for many human ailments. Similarly manufacturers of antitoxins, serums, bacterins, and other biological products utilize methods, many of which originated in veterinary science.

The public health element in veterinary science is responsible in part for many of the regulatory services which in the United States are assigned to the Bureau of Animal Industry for administration. These include international and interstate inspections including quarantines and supervision of transport of animals and animal products; meat and dairy inspections; hog cholera immunization at public markets; control and eradication of animal diseases; and coöperation with practitioner; and in local efforts in disease control.

"The service of veterinary science to public health," said Dr. Mohler, "suggests other possible applications of knowledge, obtained from livestock, for the betterment of mankind. Promising fields are those of race improvement, nutrition, and allied biological studies."

Legal protection to the practice of veterinary science is a recognized public necessity in both a national and international sense, and reported gratify-

ing improvements in the United States. All veterinarians in the public service are selected subject to civil service examinations. All the States now require licensing of veterinary practitioners, and most require that practitioners shall be graduates of approved veterinary schools. "The standards established by Federal and State laws," he said, "have helped materially to confine the practice of veterinary science to men worthy of public confidence."

MORTALITY RATES

Telegraphic returns from 86 cities, with a total population of thirty-seven millions for the week ending August 4, indicate a mortality rate of 9.9 as against a rate of 10.6 for the corresponding week of last year. The highest rate (18.7) appears for Memphis, Tenn., and the lowest (4.6) for Waterbury, Conn. The highest infant mortality rate (17.0) appears for Hartford, Conn., and the lowest for Duluth, Minn., Evansville, Ind., Fort Worth, Texas, Long Beach, Calif., Lynn, Mass., New Haven, Conn., Paterson, N. J., and Somerville, Mass., which reported no infant mortality.

The annual rate for 86 cities is 11.9 for the thirty-one weeks of 1934, as against a rate of 11.3 for the corresponding period of the previous year.

SUMMARY OF DEATHS AND DEATH RATES (ANNUAL BASIS) FROM AUTOMOBILE ACCIDENTS PER 100,000 ESTIMATED POPULATION FOR 86 CITIES FOR CORRESPONDING PERIODS OF 1934 AND 1933

	Week ending		First 31 weeks	
	Aug. 4, 1934	Aug. 5, 1933	1934	1933
Total deaths	179	166	4,844	4,338
Death rate	24.9	23.1	21.8	19.5
Deaths due to accidents in city	131	125	3,857	3,432
Death rate	18.3	17.4	17.3	15.4

—*Bureau of the Census.*

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

DIVISION OF ADULT HYGIENE

NUMBER 16 *Cancer Clinic Bulletin* AUGUST 1, 1934

The Annual Report of the Department of Public Health has just been issued. It contains some interesting figures regarding the State-aided cancer clinics as well as information regarding the activities of the Division of Adult Hygiene.

One hundred and fifty-one broadcasts were given under the auspices of the Division of Adult Hygiene; thirty-seven of these were prepared by the Massachusetts Medical Society. Replies to a questionnaire sent to some three thousand individuals indicated that the broadcasts prepared by the Medical Society were of greater interest to the radio audience than any of the others.

Sixty-five newspapers throughout the State print each week a Newspaper Health Forum. This is composed of some timely public health topic, and answers to questions sent in by readers of the papers.

The Division has distributed ten thousand pieces of literature during the year and we have on file nearly five thousand inches of newspaper clippings of various forms of health information that have been published during the past year.

Thirty-four lectures were given to audiences approximating twenty-five hundred persons. The Canti film has been shown to the biology classes in six of the Massachusetts colleges.

The Health Score Card was prepared and distributed to about five hundred individuals.

The week of June 12th was set aside as "Appendicitis Week." The Boston Health League, druggists' associations, and insurance companies coöperated. Fifteen hundred posters were displayed and twenty-five thousand flyers were distributed by drug stores, hospitals, and other organizations. The Boy Scouts of America assisted by placing the posters and flyers in the Boston drug stores. Broadcasts and lectures were given by members of the Division and others, informing the public of the campaign.

The following studies were conducted during the year:

Cancer and Other Chronic Diseases: The results of the past four years' activities in cancer and other chronic diseases were published in book form.

Cancer and Tuberculosis: The death records are being collected as a continuation of the study started last year.

Rockefeller Study: Work on this study has been progressing. This includes investigation into the etiology of cancer and the evaluation of the cancer mortality records.

Appendicitis: Most of the large hospitals have been contacted and the appendicitis records copied for the three months immediately preceding and following the Appendicitis Campaign Week of June 12, 1933, to obtain epidemiological data.

Influenza: A short study was made on this subject.

Change in Massachusetts Cancer Trend: A study was made on the change of the cancer trend in Massachusetts.

Weight and Morbidity: The chronic disease survey cards were studied in more detail to determine what relation existed between weight and morbidity. The analysis is progressing.

Chronic Rheumatism in Massachusetts: An analysis of the figures obtained in the hospital survey has been completed and a paper prepared.

Changing Vital Statistics: An analysis of the changes in the Massachusetts Vital Statistics between 1870 and 1930 is being made.

Evaluation of Radio Programs: Questionnaires were mailed to approximately three thousand individuals regarding the radio programs. An analysis of the data is being made.

Periodic Physical Examination: A study of the

literature dealing with periodic physical examination was made and a paper prepared on the subject.

Cancer Clinic Social Service Follow-Up: A study of the cancer patients from admission to death is being continued.

The work of the Tumor Diagnosis Service has continued to increase, 2,786 specimens being received for diagnosis — an increase of 188 over the preceding year. This is in spite of a slight drop in the number of surgicals from the Huntington Memorial Hospital. As in the past, the bulk of the material comes from smaller hospitals and from Massachusetts outside the metropolitan area. This year the service has been utilized by ninety-four hospitals and 549 surgeons. The number of conferences with the surgeons using the service has increased, and the pathologist is not infrequently called upon for suggestions as to radiosensitivity of various of the tumors diagnosed or other questions concerning treatment. Many of the cases from whom specimens have been received ultimately go to the Pondville Hospital. The close relationship between the laboratory here and at Pondville frequently enables additional biopsies on these cases to be dispensed with, thereby producing a considerable saving.

All the epidermoid carcinomas received in this laboratory have now been graded histologically and the results of this study have been submitted to *Surgery, Gynecology and Obstetrics.* Publication is expected in a few months. These studies have been of value in clearing up certain disputed points, such as the relation of age to the degree of malignancy, and the sex incidence of certain types of epidermoid carcinomas. A considerable number of skin cancers of various types are now being studied with the hope of working out a closer correlation between histologic appearance and the most satisfactory method of treatment.

The Massachusetts Medical Society has contributed to the cancer program by furnishing three special teaching clinics for the staffs of the cancer clinics. One was in Boston, one Worcester, and the third, Boston and Pondville.

MULTIPLE BIRTHS

Probably no five babies have ever received such concentrated attention from the public at large as the quintuplets born about two months ago to a Canadian mother. Thus the general subject of plural birth has come into prominence; such births constitute indeed one of the more remarkable phenomena in the physiology of human reproduction. It just so happens that in the human species by far the most common number of births at one confinement is one. But, although the number born at one confinement is in the great majority of cases thus limited, and is both lower and less variable in our species than in the case of most other mammals, a certain degree of variation does exist, and is found to obey, at least roughly, some kind of a law. As plural births go, twins are fairly common, about one in 87 confinements giving rise to twins. But the scarcity of plural births goes up very fast with the number born at one confinement. It has, in fact, been pointed out by W. W. Greulich of the University of Colorado that the scarcity increases approximately like the powers of 87; while one confinement in 87 brings twins into the world, triplet births would be expected about once in 7,569 confinements, this number being the square of 87; and quadruplets once in 658,503 births, this being the cube of 87. If this law continued for higher orders of plural births we should expect quintuplets once in 57 million confinements.

How do these theoretical figures compare with those actually observed in the United States in the five-year period 1926 to 1930? Actually there was one pair of twins per 86.3 confinements, one set of triplets per 8,745 confinements, and one set of quadruplets in 552,000 confinements. There were within this period of five years no quintuplets, as indeed might have been expected by the rule, since the total number of births in these five years was only about 10 million, and the rule calls for quintuplets only once in 57 million or say about once in 30 years. Thus it will be seen that in a very rough way the figures for the five-year period, 1926 to 1930, follow Greulich's rule cited above. Perhaps it should be pointed out that anything like close agreement cannot possibly be expected, because with such rare events as the birth of quadruplets and quintuplets a very large sample would be required to obtain a reliable average figure.

That the numbers cited above are by no means purely numerical curiosities is at once seen when similar observations are extended to other countries. Unfortunately, the variations in the manner of recording births, especially as regards the complicating factor of stillbirths, differ so greatly in different countries that only a few comparisons are possible. However, the following figures can be cited. In Germany, for the eight-year period, 1922 to 1929, there was one pair of twins in every 84 confinements, one set of triplets in every 8,586 confinements and one pair of quadruplets in 679,446 confinements. In Switzerland, over the seven-year period 1926 to 1932, the corresponding figures were twins in 80, triplets in 7,038, and quadruplets in 492,629. Lastly, in Canada, from which the present stir regarding plural births originates, the birth records from 1923 to 1931 show one twin birth for every 82 confinements, one triplet birth for every 7,748 confinements and there was one quadruplet birth in about every million confinements. No quintuplets were born during the nine-year period studied. This is only parallel to our own experience, for within our Registration Area in the ten-year period 1923 to 1932 there has not been a single case of quintuplets in the approximately 21,000,000 confinements falling within this period.

Does plural birth handicap the child's chance of

life? Quite naturally one would expect this to be the case, and, in point of fact, the records do in some degree bear out this supposition. In the total births that took place in the 10 years 1923 to 1932 in the United States, among those born at a single birth, 96 per cent were born alive; at twin births, only 92 per cent were born alive; at triplet births, 86 per cent, and at quadruplet births, only 72 per cent. There is thus a continual gradation, as the number at one confinement increases, culminating in a very marked handicap against the quadruplet child being born alive. Viewing these figures we are all the more pleased to recall that the quintuplets born to the Canadian mother two months ago, and born prematurely at that, fared so well and are all still alive today, thus establishing a record without precedent. It is very pleasing to think that their survival is in no small degree due to the sympathetic care and to the excellent medical attention, in the full light of medical science, which they have received. — *July Bulletin Metropolitan Life Insurance Company.*

UNIFORM PRELIMINARY EDUCATION FOR THE PRACTICE OF THE HEALING ARTS

In the effort to harmonize certain qualifications applicable to all the healing arts, the principal endeavors have been directed toward the development of examinations to test the knowledge of the prospective candidate in the several basic or fundamental sciences. In the states where multiple boards of licensure have been established the examinations in the basic sciences have fulfilled the purpose of limiting the number of inadequately prepared practitioners admitted to licensure.

The requirements for certification of the nine basic science boards now in operation are practically uniform, nevertheless, the educational preparation of the candidates appearing before these boards range from a completed high school course to a university degree in the arts or sciences, with an additional two or three years of special training in the subjects to be examined by the basic science boards. Such disparity in preparation or requirements is neither practically nor academically sound. It almost appears as if the well-trained candidate is penalized in order to favor those of much more limited preparation. It is now generally recognized that modern society demands, for the practice of any of the healing arts, a more complete cultural and academic background than is contained in the average high school course.

In the state of North Dakota a plan prevails that requires of each candidate for licensure in the healing arts evidence of a preliminary education equivalent to graduation from an accredited high school and the completion of two years' work in a recognized university or college, including one year of the physical and biologic sciences. This is a more simple method of approach and in North Dakota appears to have accomplished essentially as practicable results as by the more complicated procedure of an examination in the basic sciences.—*Federation Bulletin.* June 1934.

CORRESPONDENCE

ADHERENCE TO ETHICS OF PRACTICE

August 9, 1934.

Editor, *New England Journal of Medicine,*

As secretary of the Thurber Medical Society I am prompted to address this communication to the members of the Massachusetts Medical Society by the appearance of a recent article in one of the Boston daily papers.

The Thurber Medical Society is made up in large part of members of the Massachusetts Medical Society from Milford and surrounding towns. It is an independent organization which, because of its local history and tradition, serves as an outlet for the social and scientific life of the local medical group.

In an effort to uphold the ten principles promulgated at the eighty-fifth annual session of the American Medical Association (see *Journal A. M. A.*, June 23, 1934) a committee was appointed by the Thurber Medical Society to investigate lodge practice in Milford. The committee found that such practice averaged less than fifty cents per call. The members feel that such practice is pernicious, demoralizing and contrary to the best interests of the medical profession and the community generally.

As a result of this investigation a resolution was passed and unanimously approved by the members of the Thurber Medical Society, condemning such practice and proposing to abolish it after October 1, 1934.

I hope that this communication clarifies the issue involved. There is no "strike". The local profession is merely adhering to the sound ethical principles promulgated by the American Medical Association at its recent annual session.

Respectfully,

NICHOLAS A. MASTROIANNI, M.D.
4 Plain Street, Milford, Mass.

ADDED THOUGHTS ON THE ART OF CRITICISM

August 2, 1934.

Editor, *New England Journal of Medicine,*

With many county medical societies passing resolutions condemning hospital competition, against which I have been preaching steadily for ten years, at no small risk to my professional reputation, I feel that much of my work in the field of medical economics has been accomplished, although I believe that it still remains for me to give such competition its "coup de grace".

I believe that such an event will take place shortly.

My letter of to-day returns to the more pleasant task of discussing a straight medical problem and it might be captioned "Added Thoughts on the Art of Criticism." As a controversialist I always wel-

come criticism which demonstrates that it can stand up in the court of reason, but I abhor criticism which is made in ignorance, and is based on the experience of the Middle Ages.

To get to the root of the matter, I am becoming tired of debating the tonsil question with my patients, who come in (fortified by their general practitioners and throat specialists) with an almost unshakable faith in the necessity of a surgical tonsillectomy.

In the interest of progress I hold it no breach of modesty to say that I had no minor part in teaching the older young generation the art of such operations. I have been through the tonsil debate from bare fingers, through tonsillotomes, snare and surgical diathermy, but I have no present intention of standing still.

For the benefit of those members of the medical profession who in the course of their daily work may meet some of my patients, I wish to state that I have not removed a pair of tonsils in an adult in five years. No, I do not burn them out! I leave them right where they are, on the same theory that I do not take out every infected eye which presents itself.

What do I do with an infected tonsil? I pasteurize it, just as I would a bottle of milk. The only drawback that I have found to this method is that the patient, still retaining his tonsils, is open to the attack of those who want to take them out. What difference does it make whether they need to come out or not?

Quite by accident I discovered, five years ago, that the most alarming constitutional symptoms would subside as if by magic under the influence of a low voltage, low amperage current, applied to a very sick man, who insisted on an electric coagulation of his tonsils. He was so sick that I was unable to proceed. He had a temperature of 104°, pulse 140, projectile vomiting, every joint in his body swollen, marked purpura, and should never have been brought to my office.

After a bungling and most superficial coagulation, I sent him home, as I warned his friends, to die. One week later he returned in absolutely normal condition, tonsils lightly gray, but all constitutional symptoms absent. That case taught me a lesson, which I have followed ever since. I use this method at the present time in all cases of tonsillitis. I leave them in and pasteurize them.

Now, if this be heresy, let us see how it checks up with modern medical thought. Eminent clinicians, such as Reginald Fitz of Boston, have come to express their doubts about the efficacy of tonsil operations. Solis-Cohen of Philadelphia, after careful bacteriological research, before and one year after tonsillectomies, performed by surgeons of unquestioned skill, has demonstrated the same bacteria in the throats of patients so operated, and warns against placing reliance on such operations to give a sterile field.

Criticize if you must, but do not be mid-Victorian! It would, perhaps, be better if those who presume to give advice to the public would take the wrappers off their medical journals once in a while, in order to discover what is going on.

Yours truly,

JOHN J. HURLEY, M.D.

Hotel Braemore,
466 Commonwealth Avenue,
Boston, Mass.

THE COÖPERATION OF SURGEONS RECOGNIZED

The Commonwealth of Massachusetts
Department of Public Health
Tumor Diagnosis Service
695 Huntington Avenue, Boston

August 4, 1934.

Editor, *New England Journal of Medicine*,

May I have the privilege of thanking through your column the many surgeons who have coöperated in my pathologic study of breast lesions, carried on in the laboratory of the Massachusetts State Tumor Diagnosis Service and the Harvard Cancer Commission? The data obtained through their help have been of definite value in determining the significance of certain types of breast lesions, and I hope will react to the benefit of those making use of the Tumor Diagnosis Service.

SHIELDS WARREN, M.D.

RECENT DEATH

MACY — JOHN WILLIS MACY, M.D., of Lynnville, Iowa, and connected with the Lahey Clinic of Boston, died August 10, 1934, in Boston. He was born in 1901 and received his M.D. degree from the Iowa Medical College at Keokuk in 1928.

He was a member of the Iowa State Medical Society.

His father, Charles Macy, and two brothers, Professor Ward Macy of Coe College, Cedar Rapids, Iowa, and Dr. Carroll Macy of Sully, Iowa, survive him.

OBITUARY

RESOLUTIONS BY THE SENIOR STAFF OF THE BOSTON CITY HOSPITAL IN APPRECIATION OF DR. ABNER POST, LATE CONSULTING SURGEON

Dr. Abner Post, Consulting Surgeon to the Boston City Hospital, died in Cambridge, Massachusetts, on April 20, 1934. He was born in Westfield, Massachusetts, August 9, 1844, the son of Sylvester Gilbert Langdon and Sarah Marie (Post) Langdon. At the age of twelve his father died and the boy went to live with his maternal grandfather. At the

request of the latter he changed his name to Abner Post.

His early education was obtained at Williston Academy. He graduated from Yale in 1866 and received his M.D. from Harvard in 1870. His internship was served at the Massachusetts General Hospital. Following two years' study abroad, he returned to Boston and became affiliated with the U. S. Marine Hospital at Chelsea as assistant surgeon.

In 1876 he was appointed to the Staff of the Boston Dispensary, continuing his work there until he retired on December 31, 1913.

In 1882 he was appointed to the Surgical Staff of the Boston City Hospital, rising through the various ranks to that of Senior Visiting Surgeon in 1897. This rank he held until his resignation in 1906. He was then appointed Consulting Surgeon.

At the Children's Hospital he was appointed Assistant Surgeon in 1881 and Surgeon in 1887. In 1892 he was made Consulting Surgeon and held that rank until his death.

For a time he held the position of Consulting Physician in Syphilis at the Massachusetts General Hospital.

In 1882 he was appointed Clinical Instructor in Syphilis at the Harvard Medical School, Instructor in Syphilis in 1895, Assistant Professor of Syphilis in 1906, Professor of Syphilis in 1911, resigning in 1916 at which time he was appointed Professor Emeritus. At the time of his death he was the oldest member of the Harvard Faculty.

While trained as a surgeon, early in his career and possibly because of the opportunity afforded for the study of venereal disease, or because of his association with the dermatologist and syphilographer, Dr. Francis B. Greenough, he became interested in syphilis, later to be recognized internationally as an outstanding syphilographer.

As a surgeon he will be remembered as having been most conscientious and painstaking, ever alert to grasp opportunities for advancement, and resourceful in emergencies.

As a syphilographer he will be known as one of the pioneers. His interest in extragenital and inherited syphilis will be recalled by those studying under him. Again in the problem of syphilis his grasp of opportunities was evidenced by his early recognition of the value of the x-ray in lesions of the bones, joints, and lungs, and later, the value of salvarsan in treatment. His broad views of the manifestation of syphilis are demonstrated by his intense interest in the cutaneous and ophthalmologic lesions associated with this disease.

As a teacher he was enthusiastic and inspiring to the student body, a keen observer, and intensely practical in his views as to treatment.

Dr. Post was an Associate Editor of the *Boston Medical and Surgical Journal* from 1881 to 1890. His contributions to medical literature, both in Surgery and Syphilis, were well prepared, concise, and convincing.

His professional memberships included the Massachusetts Medical Society, the American Medical Association, New England Dermatological Society, American Urological Association, and the American Dermatological Association.

His avocation demonstrated the qualities of one interested in the many manifestations of the beauty of nature. Fortunately, and in spite of physical infirmities incident to age, he was long able to retain mental vigor thus to enjoy his family, his friends, and his books.

His wife, Laura Knight Post, died in 1927. He is survived by a daughter, Mrs. Stephen A. Breed.

P. F. Butler, M.D., *Secretary Senior Staff.*

July 31, 1934.

NOTICES

REMOVAL

Willard S. Parker, M.D., announces the removal of his office to 270 Commonwealth Avenue, Boston.

INTERNATIONAL MEDICAL POSTGRADUATE COURSES

The Berlin Academy for Medical Postgraduate Training has arranged for a series of postgraduate exercises in October, 1934.

Programs and further particulars are obtainable from the Berlin Academy for Medical Postgraduate Training, Berlin NW 7, Robert Koch-Platz 7 (Kaiserin Friedrich-Haus). German as well as foreign doctors can attend the courses.

Foreign students attending the courses can obtain a reduction of sixty per cent in fares from the German railways.

REPORT OF MEETING

WORCESTER NORTH DISTRICT MEDICAL SOCIETY

The meeting of the Worcester North District Medical Society was held at the Heywood Memorial Hospital, Gardner, July 25, 1934. In the absence of Dr. C. B. Gay, President, Dr. F. M. McMurray, Secretary, called the meeting to order and Dr. C. S. Lancey of Gardner was elected as chairman of the meeting.

After a dinner and the business session, the Society was entertained by Dr. George Burgess Magrath who drew from his long and interesting career topics relating to the duties of medical examiners, and the behavior of doctors as witnesses before the courts, warning them that a witness should never

lose his temper and should be ready to acknowledge his inability to answer questions propounded by attorneys. He gave accounts of some important cases in which poison played a significant part.

There was an unusually large attendance.

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

August 18 - September 30—Medical Study Trip to Hungary. See page 975, issue of May 10.

September 3-6—American Public Health Association at Pasadena, California. Dr. J. D. Dunshee, Chairman, Local Committee on Arrangements.

September 4, 5, 6—International Union Against Tuberculosis. For information address the National Tuberculosis Association, 450 Seventh Avenue, New York City.

September 10, 11, 12, and 13—American Congress on Physical Therapy will meet in Philadelphia at the Bellevue Stratford. For details write American Congress of Physical Therapy, 30 North Michigan Avenue, Chicago, Illinois.

September 10-15—First International Congress of Electro-Radio-Biology will be held in the Doges Palace at Venice. For details address the General Secretary of the Congress, Dr. Giocondo Protti, S. Gregorio 173, Venice (Italy).

September 18, 19 and 20—Tenth Clinical Congress of the Connecticut State Medical Society. See page 287, issue of August 9.

September 27 and 28—International Association for Preventive Pediatrics will be held at Lyons. For details address the Secretary of the I. A. P. P., 15 rue Lévrier, Geneva (Switzerland).

September 28-29—New England Surgical Society will meet at Burlington, Vermont. For details address the Secretary, Dr. John M. Birnie, 14 Chestnut Street, Springfield, Mass.

October—International Medical Postgraduate Courses. See page 335.

October 22 - November 2—1934 Graduate Fortnight of the New York Academy of Medicine. See page 1240, issue of June 7.

October 31 - November 2—Massachusetts State Nurses' Association, Hotel Statler, Boston. For information write Miss Helene G. Lee, R.N., 420 Boylston Street, Boston.

April 29 - May 3, 1935—The American College of Physicians will meet in Philadelphia. For information address Mr. E. R. Loveland, Executive Secretary, 133-135 South 36th Street, Philadelphia, Pa.

June, 1935—Medical Library Association will meet in Rochester, N. Y. For details address the Secretary: Miss Frances N. A. Whitman, Librarian, Harvard University Schools of Medicine and Public Health, Boston, Mass.

ODE TO THE DOCTOR AND HIS WIFE

Editor, *New England Journal of Medicine*,

When I was in Nova Scotia at the Annual Meeting of the Nova Scotia Medical Society, last July, a wife of one of the doctors read a poem at dinner which appealed to everyone very much.

She has just sent me a copy of it which I am enclosing herewith.

Yours very sincerely,

H. M. Clute, M.D.,
The Lahey Clinic.

Ode to the Doctor's Wife

Who stays at home to mind the 'phone,
And never dares herself to roam,
But spends most of her time alone?
The Doctor's Wife.

When he's away, and wee ones ill,
Who hunts around for "sample" pill,
And prays its right to give to Bill?
The Doctor's Wife.

And when the day is screaming hot,—
Supplies for larder must be bought,
Who lacks a car,—so she must trot?
The Doctor's Wife.

Who, when they both are snug in bed,
And noisy 'phone rings overhead,
Must say,—"he's out" till face is red?
The Doctor's Wife.

Who, to escape from household care,
Makes calls with Pa to get the air,—
Waits hours in car in lone despair?
The Doctor's Wife.

When curious dames seek information,
About a patient's operation,
Who answers,—with equivocation?
The Doctor's Wife.

Who when this weary life is o'er,
Will surely reach the Golden Shore,
And rest in Heaven for evermore?
The Doctor's Wife.

Ode to the Doctor

Who works from morn to set of Sun,
The whole day long is on the run,
And yet whose work is never done?
The Doctor.

Who's roused up in the dead of night,
By some one in a dreadful fright,
Who's sure she's going to die outright?
The Doctor.

Who when the days are shocking hot
Can seek no cool sequestered spot,
Because he must be on the trot?
The Doctor.

Who, when the mercury is low,
Long weary miles must often go,
Through cutting winds and blinding snow?
The Doctor.

Who has to hear the countless ills,
And deal out multitudes of pills,
To those who never pay their bills?
The Doctor.

Who must not show that it's a bore,
To hear each family history o'er,
For generations back and more?
The Doctor.

Who should be placed among the saints,
Whom history with us acquaints,
For patient listening to complaints?
The Doctor.
(Author unknown.)

Written by Mrs. A. McD. Morton and included in her response to the toast to the ladies at the 81st Convention of the Nova Scotia Medical Society, Yarmouth, July, 1934.

BOOKS RECEIVED FOR REVIEW

Studies from The Rockefeller Institute for Medical Research. Reprints. Volume 89. 605 pp. New York: The Rockefeller Institute for Medical Research, 1934.

A Textbook of Bacteriology. With a section on pathogenic protozoa. By Hans Zinsser, and Stanhope Bayne-Jones. Seventh Edition. 1226 pp. New York: D. Appleton-Century Company. $8.00.

Epidemic Myalgia. Bornholm Disease. By Ejnar Sylvest. 155 pp. Copenhagen: Levin & Munksgaard.

Clio Medica. Edited by E. B. Krumbhaar. XIII. German Medicine. By W. Haberling. 160 pp. New York: Paul B. Hoeber, Inc. $1.50.

Clio Medica. Edited by E. B. Krumbhaar. XIV. Medicine in Persia. By Cyril Elgood. 105 pp. New York: Paul B. Hoeber, Inc. $1.50.

A Textbook of Histology. By Alexander A. Maximow and William Bloom. Second Edition. 662 pp. Philadelphia and London: W. B. Saunders Company. $7.00.

The Spastic Child. By Marguerite K. Fischel. 97 pp. St. Louis: The C. V. Mosby Company. $1.50.

Constructive Eugenics and Rational Marriage. By Morris Siegel. 196 pp. Toronto: McClelland & Stewart, Limited. $2.50.

The Jew in Science. By Louis Gershenfeld. Distributed by The Jewish Publication Society of America. 224 pp. $2.75.

Conception Period of Women. By Dr. Kyusaku Ogino. 95 pp. Harrisburg, Pa.: Medical Arts Publishing Company. $1.00.

Postures and Practices During Labor Among Primitive Peoples. By Julius Jarcho. 175 pp. New York: Paul B. Hoeber, Inc. $3.50.

The Laboratory Notebook Method in Teaching Physical Diagnosis and Clinical History Recording. By Logan Clendening. 71 pp. St. Louis: The C. V. Mosby Company. $.50.

Medicine Marches On. By Edward Podolsky. 343 pp. New York and London: Harper and Brothers, Publishers. $3.50.

The Power to Love. A Psychic and Physiologic Study of Regeneration. By Edwin W. Hirsch. 351 pp. New York: Alfred A. Knopf. $4.00.

BOOK REVIEWS

Corrective Physical Education. By Josephine Langworthy Rathbone, M.A. Instructor in Physical Education. Teachers College, Columbia University. Illustrated. Philadelphia and London: W. B. Saunders Company, 1934. $2.50.

A successful and experienced physical educator has written a book which other physical educators and students in training schools will find useful. The diction is excellent. Although the author modestly states in the preface that there is nothing original in the text except the arrangement and the emphasis placed upon certain phases of the subject, she forgets that opinions as to the relative value of methods which have crystallized as a result of long and close observation of standardized techniques may be more valuable than the advocacy of an original personal system. Like many books of small compass (some 250 pages), certain essentials are slighted. To discuss thoroughly anatomy, neuromuscular physiology, faulty development, an exercise program, the orthopedic lesions due to heredity, congenital lesions and birth injuries, bone and joint diseases, and traumatic lesions, is an impossible task. The author has added two other chapters on physical therapy in the treatment of mental and emotional maladjustments and on the school problem. The fact that the reviewer does not find himself in accord with certain opinions of the author may mean that his experience has been less. The book is quite well illustrated and contains a glossary, a bibliography and a satisfactory index.

La Résection Endoscopique de la Prostate. Par le Dr. Ed. Papin. 66 pp. Paris: Gauthier-Villars, 1934. 30 fr.

This small monograph of sixty-four pages on prostatic resection contains what the reviewer feels is a splendid survey of the status of this operative procedure. It is in direct accordance with the views held by many urologists in Boston. Papin is not impressed by the excellent results reported, and emanating from this side of the Atlantic. The book is a cool, deliberate, thoughtful evaluation of the operation without the "Moonlight and Roses."

The technique as carried out by the author is essentially the same as described by McCarthy, except that the sheath of the resectoscope is not made of bakelite.

It is interesting to note Papin's indications for this operative procedure, namely, fibrous bars, median lobes (small), and small adenomas. Large lateral lobes contraindicate the use of the resectoscope.

The results of sixty prostatic resections are reported, with a mortality of five per cent (3 cases; one each from pulmonary embolism, septicemia, and hemorrhage).

Fundamentals of Biochemistry in Relation to Human Physiology. By T. R. Parsons. Fourth Edition. 435 pp. Baltimore: William Wood & Company. $3.00.

This is the fourth edition of a textbook that is an elementary introduction to biochemistry. The author has carried out his aim of presenting the fundamental theoretical principles of biochemistry without too great a mass of detail. The informal narrative style makes reading exceptionally easy. In the present edition, the text has been revised and enlarged, bringing the book up-to-date.

The first half of the book deals with the chemistry and metabolism of proteins, fats and carbohydrates. Formulae of a moderate number of substances are given with explanations of their derivations and their relations to similar compounds. Of the few practical tests given, the mechanism is explained. The metabolism of all groups of substances is followed in considerable detail.

The rest of the book covers briefly calorimetry of the human body, enzymes, oxidation catalysts, vitamins, pigments of the body, and the carriage of oxygen and carbon dioxide by the blood. There is a very brief section on the applications of physical chemistry, including an explanation of osmotic pressure, the properties of colloids, the significance of the hydrogen ion concentration of body fluids, buffer action, and the importance of electrolytes in life processes.

Many complicated chemical and physiological processes are presented in a comparatively simple, clear and interesting manner, without sacrifice of accuracy. Adequate distinction is made between theories that have been substantiated and those for which there is as yet little proof. The book is well adapted for elementary students of biochemistry.

A Practical Treatise on Diseases of the Skin for the Use of Students and Practitioners. By Oliver S. Ormsby, M.D., Clinical Professor and Chairman of the Department of Dermatology, Rush Medical College of the University of Chicago; with revision of the histopathology in this edition by Clark Wylie Finnerud, M.D. Fourth Edition, thoroughly revised. 1288 pp. Philadelphia: Lea and Febiger. $11.50.

It says in the Preface that "to incorporate new material and yet keep the book reasonable in size much reconstruction has been necessary". The task has been accomplished successfully. Dr. Ormsby has rewritten the description of twenty diseases and has added descriptions of thirty-six new diseases and one hundred and twenty-four new illustrations. Yet the book is not over-large nor over-heavy for comfortable handling.

The chief characteristics of the text are the thoroughness with which each topic is treated, the total lack of useless verbiage and the easy, flowing style. Each word seems to have been chosen because of its fitness. Each sentence says what it is intended to say. The result is a description which is at once intelligent, concise, sharply defined and clear.

Dr. Ormsby deserves especial credit for his Introduction. When one writes of a prosaic subject one is apt to become prosaic himself. Dr. Ormsby has actually made the story of the fundamentals of anatomy, physiology and pathology interesting. In two other ways his Introduction is unique. When he refers to a test or a method he does not rest content with the mere mention. He describes the test or the method, tells what it is for, how it is performed and what information it gives. A second unique feature is a scheme or outline to be followed in the taking of the history and the examination of the patient.

Especial commendation is also due Dr. Ormsby for the careful and interested attention he has paid to therapeutics throughout the book. Too often an author says little about the treatment of disease and that not convincingly because he is interested chiefly in diagnosis. Dr. Ormsby, on the contrary, gives quite as much thought and as much detail to treatment as to the rest of the book, to the great benefit of the reader.

Altogether Dr. Ormsby has produced a textbook on dermatology which every student and every practitioner should keep at his side for study and for reference. He will find it complete, helpful and practical.

The Laboratory Notebook Method in Teaching Physical Diagnosis and Clinical History Recording. By Logan Clendening. 71 pp. St. Louis: The C. V. Mosby Company. $.50.

This "laboratory notebook" or outline of physical diagnosis should be of great interest to teachers of internal medicine because of the educational technique which it applies. Unlike other outlines in use it is not merely a list of points to be examined, which the student will study only perfunctorily if at all. In contrast, this book uses that very effectual device for holding the attention, the question method; furthermore, if the book is used as intended, the student is required to ponder and to work out the questions and to answer them all in writing. Thus evidence is gained that every student has devoted thought to all matters within the scope of the course and with what success. A course thus conducted must necessarily be a thorough one.

History taking and physical examination of all parts of the body are considered in a well-judged degree of detail. On the last page there are a few questions on urine, stool, etc., which suggest to the mind the desirability of a similar outline dealing with clinical laboratory diagnosis.